

IN THE PURSUIT OF BECOMING A RESEARCH UNIVERSITY

by

Juan Carlos Enríquez Gutiérrez

A dissertation Submitted to the Faculty of the
CENTER FOR THE STUDY OF HIGHER EDUCATION

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

2008

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Juan Carlos Enríquez Gutiérrez entitled In the Pursuit of Becoming a Research University and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy

Gary Rhoades

Date: 1/22/2008

Jenny J. Lee

Date: 4/17/2007

Alma Maldonado-Maldonado

Date: 4/17/2007

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director: Gary Rhoades

Date: 1/22/2008

STATEMENT BY THE AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his or her judgment the proposed use of the material is in the interest of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: Juan Carlos Enríquez Gutiérrez

ACKNOWLEDGMENTS

The completion of this journey has been possible thanks to many people to whom I will be forever grateful.

I am particularly indebted to Juan Manuel Durán who supported my plans to pursue a Ph.D. in all regards from the very beginning. I am also appreciative of Rafael Rangel who enthusiastically embraced my plans and allowed them to materialize.

My gratitude also goes to Enrique Ramos who encouraged me to pursue my degree at The University of Arizona and helped to make it possible.

Many thanks to Gary Rhoades for always extending a helping hand in all matters from the beginning to the end. Thanks to Alma and Jenny who were always willing to assist me. In this regard, I also extend thanks to Sylvia here and Paty in Mexico.

I am very grateful to Christine for their help not only with proofreading practically all my writing but also with providing feedback on how to improve it.

Finally, I consider myself very blessed to have had the company and assistance of my colleagues and now friends Pablo and Martín through the time it took to complete our Ph.D.'s; my appreciation to them both.

DEDICATION

To God.

I also dedicate this achievement in loving memory of my father and to my mother who has always infused me with the discipline of setting high goals and working to achieve them.

To my beloved siblings: Teresita, Fabiola, Edith, and Raúl.

To my wife, who happily left her comfort zone to accompany me on this adventure, and to our wonderful daughters: Paulina, Estefanía, Mariana, and Natalia. Apart from being the best gift I have ever received, they are a source of inspiration to me in everything.

TABLE OF CONTENTS

| | |
|---|----|
| LIST OF TABLES | 9 |
| ABSTRACT | 10 |
| CHAPTER I: INTRODUCTION..... | 12 |
| <i>Overview of the topic</i> | 12 |
| <i>Statement of the problem</i> | 13 |
| <i>Statement of purpose</i> | 16 |
| <i>Research questions</i> | 17 |
| <i>The Mexican higher education system</i> | 19 |
| <i>Capacity expansion</i> | 21 |
| <i>Private institutions</i> | 22 |
| <i>Graduate education</i> | 23 |
| <i>Significance of the study</i> | 26 |
| <i>Organization of the study</i> | 27 |
| CHAPTER II: REVIEW OF THE LITERATURE..... | 29 |
| Introduction..... | 29 |
| Literature regarding external forces..... | 29 |
| <i>The knowledge economy</i> | 29 |
| <i>Institutional adaptability</i> | 30 |
| <i>Competitiveness</i> | 31 |
| <i>Institutional capitalism</i> | 33 |
| Literature regarding institutional environment..... | 34 |
| <i>Culture of academic science</i> | 34 |
| <i>Institutional drift</i> | 35 |
| <i>Mission creep</i> | 35 |
| <i>Mission creep at community colleges</i> | 36 |
| <i>Mission creep at state colleges and universities</i> | 37 |
| <i>Mission creep in colleges becoming universities</i> | 38 |
| <i>Mission creep at comprehensive universities</i> | 39 |
| Literature regarding resource allocation..... | 41 |
| <i>Power</i> | 41 |
| <i>Rationality</i> | 46 |
| <i>Prestige</i> | 47 |
| Theoretical frameworks..... | 48 |
| <i>Academic capitalism</i> | 48 |
| <i>Institutional theory</i> | 51 |
| <i>Hackman's theory of resource allocation</i> | 54 |
| Conclusions..... | 56 |

TABLE OF CONTENTS - *Continued*

| | |
|---|-----|
| CHAPTER III: METHODS..... | 58 |
| <i>Introduction</i> | 58 |
| <i>Research questions</i> | 58 |
| <i>Overall approach</i> | 60 |
| <i>Site selection</i> | 61 |
| <i>Sub-sites selection</i> | 64 |
| <i>Querétaro campus</i> | 67 |
| <i>León campus</i> | 68 |
| <i>Sample population</i> | 70 |
| <i>Researcher's positionality</i> | 73 |
| <i>Data collection</i> | 74 |
| <i>Ethical considerations</i> | 76 |
| <i>Data analysis</i> | 77 |
| <i>Limitations</i> | 79 |
| <i>Conclusions</i> | 80 |
| CHAPTER IV: FINDINGS AT THE SYSTEM LEVEL..... | 81 |
| <i>Introduction</i> | 81 |
| <i>The institution's role in Mexico's development</i> | 82 |
| <i>Competitiveness</i> | 83 |
| <i>The knowledge economy</i> | 84 |
| <i>The rationale for research</i> | 85 |
| <i>The research strategy</i> | 86 |
| <i>Knowledge transfer</i> | 87 |
| <i>Type of research</i> | 88 |
| <i>Self-sufficiency</i> | 89 |
| <i>Focus of research</i> | 91 |
| <i>The vice presidency for research and development (VID)</i> | 93 |
| <i>Endowed chairs</i> | 94 |
| <i>Technology parks</i> | 99 |
| <i>Business incubators</i> | 100 |
| <i>Networks</i> | 102 |
| <i>Technology transfer</i> | 106 |
| <i>Prestige</i> | 112 |
| <i>Inadequacies</i> | 119 |
| <i>Conclusions</i> | 120 |

TABLE OF CONTENTS - *Continued*

| | |
|--|-----|
| CHAPTER V: FINDINGS AT THE CAMPUS LEVEL..... | 122 |
| Introduction..... | 122 |
| The institution's León campus..... | 124 |
| <i>The rationale for research.....</i> | 124 |
| <i>The campus research strategy.....</i> | 129 |
| <i>Type of research.....</i> | 131 |
| <i>Focus of research.....</i> | 132 |
| <i>Who are called to do research?</i> | 133 |
| <i>The state of research at the campus.....</i> | 139 |
| <i>Research appropriateness for the campus.....</i> | 142 |
| <i>Necessary actions to further endorse research.....</i> | 145 |
| The institution's Querétaro campus..... | 151 |
| <i>The rationale for research.....</i> | 151 |
| <i>The campus research strategy.....</i> | 156 |
| <i>Type of research.....</i> | 164 |
| <i>Focus of research.....</i> | 167 |
| <i>Who are called to do research?</i> | 173 |
| <i>The state of research at the campus.....</i> | 179 |
| <i>Research appropriateness for the campus.....</i> | 181 |
| <i>Necessary actions to further endorse research.....</i> | 184 |
| Conclusions..... | 189 |
| CHAPTER VI: CONCLUSIONS..... | 191 |
| <i>Introduction.....</i> | 191 |
| <i>Revisiting the purpose of the study and research questions.....</i> | 191 |
| <i>Appropriateness of the theoretical frameworks.....</i> | 205 |
| <i>Academic capitalism.....</i> | 206 |
| <i>Institutional theory.....</i> | 211 |
| <i>Hackman's theory of resource allocation.....</i> | 213 |
| <i>Implications for practice.....</i> | 214 |
| <i>Implications for further research.....</i> | 219 |
| <i>Concluding thoughts.....</i> | 222 |
| APPENDIX: THE INTERVIEW PROTOCOL..... | 230 |
| REFERENCES..... | 231 |

LIST OF TABLES

| | | |
|----------|--|----|
| Table 1, | Mexico's population and access to higher education..... | 21 |
| Table 2, | Higher education institutions by sector and enrollment range in 2001.. | 23 |
| Table 3, | Profile of interviewees drawn from Querétaro and León campuses..... | 71 |
| Table 4, | Places where interviewees pursued their graduate studies..... | 72 |
| Table 5, | Codes used during data analysis..... | 78 |

ABSTRACT

Many universities and colleges are shifting their missions from teaching-oriented to research-oriented (Clark, 1978, 1983; Riesman, 1956; Selingo 2000), a phenomenon that has become known as academic/institutional drift. During recent years, the knowledge society has created an environment that further encourages the shift by influencing stakeholders in higher education institutions to increasingly accept the role played by research institutions as the most legitimate. Consequently, higher education institutions are becoming increasingly involved in the pursuit of knowledge creation. They are concluding that legitimacy and prestige will be obtained in return, as well as material resources (Slaughter & Rhoades, 2004).

Despite the fact that the production of knowledge by Latin American universities is marginal in an international context (Albornoz, 1993; Albatch, 2003), some of them are experiencing institutional drift. Using a case study in combination with a qualitative approach, this research project aims to highlight the nature and implications of the phenomenon through focusing on a Mexican university system. Semi-structured interviews with individuals occupying key positions within the organization and institutional documents constitute the study's sources of information. In addition, academic capitalism, institutional theory, and Hackman's theory of resource allocation are utilized as its theoretical framework.

The findings of the study show that although the institution is actively engaging in academic capitalism, societal benefit is not being neglected as a result of such

engagement. Nonetheless, the findings relate academic capitalism to further stratification within and across the institution's campuses. It is also concluded that the institution is experiencing isomorphic change by modeling itself after those universities it perceives as prestigious and legitimate in the research endeavor. Regarding internal resource allocation, it is demonstrated that a unit's centrality with respect to the institution's research strategy greatly explains its gains in institutional resources.

This study also includes some implications and recommendations for the institution to concentrate on and/or address in order to succeed in its research endeavor. Lastly, some considerations regarding further research are introduced.

CHAPTER I: INTRODUCTION

Overview of the topic

It is said that mission is the *raison d'être* for an organization, the justification for its existence. As organizations, universities have missions as well. A university's mission reflects those things to which the institution is committed. For more than a century, the main functions of universities worldwide have traditionally been teaching, research, and service. Nonetheless, important differences among universities appear while they work towards fulfilling those functions. Universities that have engaged in research as a central part of their mission have advanced knowledge and led society towards progress as a result. Prestige and legitimation are what universities have gained in return. In fact, in the highly stratified American higher education system, research oriented institutions, are at the apex (Clark, 1983; Trow, 1984). The 2000's Carnegie Classification of Institutions of Higher Education ranks only 261 out of 2,272 American four-year institutions as research universities. Nevertheless, many universities are willing to adopt the goals and measures appropriate only for the few larger institutions with ample research funding (Lynton & Elman, 1987). The vast majority of academic institutions have been influenced to pursue research due to its association with institutional prestige (Fulton & Trow, 1975). An institution is ranked based on its prestige status, reflecting a perceived quality and distinction as an academic institution (Trow, 1984).

Seeking more prestige and rewards, many universities and colleges are shifting their missions from teaching-oriented to research-oriented (Clark, 1978, 1983; Selingo, 2000),

a phenomenon that has become known as academic/institutional drift. Remarkably, this process of institutional imitation is not new. Indeed, it was first identified a half-century ago by David Riesman (1956). To him, the organizational field of higher education behaves as a 'snakelike procession' in which both low and middle prestige institutions (the snake's tail and body respectively) try to move up and catch the most prestigious institutions (the snake's head). The praised diversity within the American higher education system is then constrained by the shift towards isomorphism (Ashby, 1971). The process is additionally fueled through the pressure exerted by accrediting agencies which force all accredited institutions to meet similar standards (Jencks & Riesman, 1968). However, for lower ranked institutions, it is difficult and perhaps almost impossible to move up the prestige ladder (Winston, 1999). The advantages to institutions at the apex are so overwhelming that they create for themselves a kind of 'virtuous circle' in which advantage begets advantage (Trow, 1984; Kerr, 2001). Despite all the above, Clark (1978) asserts that, from a cross-national comparison, institutional differentiation has proven to be the most important characteristic higher education systems must observe for their viability in the long run.

Statement of the problem

Knowledge-based economies are built on the production, distribution and the use of knowledge and information (OECD, 1996). They focus on applying knowledge to produce economic benefits. Underscoring the salient characteristics of the knowledge society, Drucker (1993) stated that:

The new [knowledge] society -and it is already here- is a post-capitalist society. The basic economic resource...*is and will be knowledge*. The central wealth-creating

activities will be neither the allocation of capital to productive uses nor “labor”...Value is now created by “productivity” and “innovation”, both applications of knowledge to work. The leading social groups of the knowledge society will be “knowledge workers” -knowledge executives who know how to allocate knowledge to productive use...knowledge professionals; knowledge employees....The *economic* challenge of the post-capitalist society will therefore be the productivity of knowledge work and the knowledge worker. (pp. 7-8)

The knowledge society places universities in the spotlight expecting them to be the main providers of both knowledge and knowledge workers. In the United States as well as in other developed countries, a research university can meet those expectations (Kerr, 2001). Accordingly, policy related to the knowledge economy as well as globalization pressures higher education institutions worldwide to change (Bullen, Robb, & Kenway, 2004). Under this pressure, universities are increasingly conducting more applied research to the detriment of basic research and some applaud that shift (Lynton & Elman, 1987). Knowledge resulting from applied research has a higher commercial value, which is what knowledge-based economies reward and encourage the most.

According to Clark (1978, 1983), incentives towards institutional uniformity would not exist if the different roles reserved for higher education institutions were all legitimate. For him, institutions opt for either differentiation or *dedifferentiation* (i.e. homogenization) as a means of viability. When stakeholders –students, faculty and staff, trustees, the community- in each type of higher education institutions accept more than one role, there is no incentive for dedifferentiation. Nevertheless, institutions will tend to *dedifferentiate* in response to fewer legitimate roles for themselves and this seems to be the case in the knowledge economy. That is, the knowledge society has created an environment that encourages stakeholders of higher education institutions to increasingly

accept the role played by research institutions as the most legitimate one. Consequently, higher education institutions are becoming increasingly involved in the pursuit of knowledge creation. They are concluding that legitimacy and prestige will be obtained in return, as well as material resources (Slaughter & Rhoades, 2004).

In an international context, the contribution of Latin American universities to the production of knowledge is marginal (Albornoz, 1993). Using Altbach's (2003) thesis of center and periphery, Latin American universities are peripheral and basically distributors of knowledge created by central institutions located in developed countries. Furthermore, Altbach (1998) posits that even when in some cases they are central in their national context, all Third World universities are peripheral in an international context. Nonetheless, the global knowledge economy is also putting pressure on Latin American universities to produce knowledge in an application context as the way to be globally competitive (Arocena & Sutz, 2004). Some of these universities are engaging in this mode of knowledge production. Since no research has been reported in this regard, it is not possible to estimate their level of achievement.

Finally, it is worrisome that more stratification within higher education could result from the phenomenon of higher education institutions shifting missions from teaching-oriented to research-oriented in addition to an increased focus on applied research as a mode of knowledge production. Furthermore, Rhoades and Slaughter (1997) assert that the context in which a knowledge economy and globalization operate fosters the restratification of higher education. Stratification is viewed as undesirable because it implies systematic and unequal distribution of resources and rewards such as wealth,

power, and prestige within or among social systems. Many forms of stratification exist within higher education and many strategies to eliminate it have been developed. Equal opportunity access to higher education, for example, is one of those strategies. However, when seeking prestige, higher education institutions easily reduce their level of openness to the masses and further stratification is therefore created.

Statement of purpose

The purpose of this study is to explore the rationale and strategies associated with increasing engagement in sponsored, applied research in a private Mexican university system. The resistance and commitment of people within the institution regarding this research orientation are also addressed. Furthermore, the study focuses on the capacity required to fulfill the research goal as well as on the stratification across the organizational units within the institution that may result from this process.

The institution selected for conducting this study is the Tecnológico de Monterrey, a Mexican private nonprofit, highly selective, comprehensive university system with 33 campus sites in 28 different cities. It is the largest of its type in Mexico and was founded in 1943. During the fall semester 2005, it enrolled 28,613 high school, 56,398 undergraduate, and 10,766 graduate students. In the same period, its faculty comprised 2,984 full-time and 5,194 part-time professors. Many of the institution's academic programs are nationally and internationally accredited. Based on its characteristics, it could be concluded that the institution is a leader or, according to Altbach's (1998) typology, central to the Mexican higher education system.

From its foundation and over the ensuing forty years, research was not explicitly considered part of the Tecnológico de Monterrey mission. Nonetheless, in 1985, a new mission was released and included research as one of the system's goals. Since then, research has been included in the 1995, 2005, and 2015 mission statements, the last released in February 2005. It is asserted by the institution that, through its research centers, it promotes the integration of the country and its regions into the knowledge economy.

Using a qualitative approach as its methodology and a case study as its selected strategy of inquiry, this study attempts to fully address the purposes previously enunciated. Three theories constituted the theoretical framework to deal with the research problem: academic capitalism, institutional theory, and Hackman's theory of resource allocations. Aiming to capture a wide range of perspectives, individuals were interviewed who are knowledgeable about the issues on which this study is focused and who occupy key positions within the organization. Information was gathered through semi-structured interviews containing open-ended questions. The sample of respondents was drawn primarily from two campuses of the institution. Institutional documents were also analyzed and used as a complementary method of data gathering.

Through the conduct of this study, some light will be cast on the nature and implications of the institutional drift phenomenon so prevalent currently among higher education institutions within the context of a knowledge-based economy.

Research questions

Three research questions with sub-questions were developed for this study. They are:

1. What are the rationales and strategies behind the institution's orientation towards conducting sponsored applied research?
 - 1.1. To what extent is that orientation being realized?
 - 1.2. What sources of support/resistance to the research orientation are evident?

2. To what extent are people within the institution resistant or committed to its research goal?
 - 2.1. What kind of research, if any, do they believe the institution should conduct?

3. How feasible is fulfillment of the research goal?
 - 3.1. Do people within the institution believe that the institution has enough resources to undertake the research challenge?
 - 3.2. Do people within the institution anticipate/see greater stratification among campuses as a result of the research orientation?

The first question addresses the reasons behind the institution's commitment to research as well as the strategies associated with it. Concepts like power, prestige, centrality, legitimacy, and closeness to the market may arise explicitly or implicitly from the answers to this question as an indication that academic capitalism and/or institutional theory are acting on the institution's research orientation. The identification of possible inhibitors to that orientation is also a goal of this question.

The second question acknowledges the possibility of disagreement among people within the institution about the intended research goal. Disagreement at any level could be rooted in people's understanding of research or the kind of research they believe the institution should conduct, if any.

Lastly, the third question focuses on the feasibility that the research goal will succeed. People within the institution could disagree about the institution's readiness to undertake its research goal. This question also considers the possibility of stratification within the institution reflected in dissimilar contributions across different campus sites as well as across the academic units within each campus as a result of the research orientation. The findings for this question were contrasted with Hackman's theory of resource allocation and with academic capitalism, both theories that are part of the theoretical framework of this study.

The Mexican higher education system

A commitment to higher education gains relevance in knowledge societies and access to it becomes critical. Alas, the majority of countries have, according to Trow's (1973) typology, *elite* systems of higher education. That is, not more than 15% of their population eligible for tertiary education has access to it. This situation is characteristic of most of the so-called Third World nations. On the other hand, some countries have *mass* higher education systems (granting access from 15%-50% of the college aged population). Just a handful can boast *universal* systems (more than 50% of the college aged population). Obviously, the largest systems are found in developed nations.

Mexico is among the Third World countries that have been struggling for decades to develop a higher education system. By 2005, its population accounted for 103.2 million (INEGI, 2005). Although there is no consensus, it is estimated that around 40% of the Mexican population lives in poverty. Also in 2005, the illiteracy rate in adults aged 15 or more was 8.6% and their average years of schooling were 8.1. Nonetheless, Mexican

government officials claim that the educational system now has enough capacity to enroll all children up to 15 years of age in elementary or middle schools. With respect to access to higher education, 24.2% of 9 million people aged 20-24 attended higher education institutions during the 2004-2005 academic year. This cohort will reach its peak in 2010 with 10.4 million people. Therefore, access to secondary and tertiary education will continue to be a challenge in Mexico for years to come.

According to the Association of Universities and Higher Education Institutions (ANUIES), Mexican colleges enrolled 2,168,510 students during the 2004-2005 academic year (ANUIES, 2005). The largest share of student enrollment is related to universities, teachers colleges, and technological institutes at 96.6%. Conversely, associate professionals who attend technological universities represent just 3.4%. Graduates from technological universities can transfer to another institution, such as a university or technological institute, in order to earn a bachelor's degree.

Excluding the figures related to teachers colleges, 67.3% of students attended public institutions. With the exception of the four so-called federal institutions, funding for public higher education in Mexico comprises federal and state subsidies. The share of federal and state government funds for public institutions varies considerably across the states. In addition to the public subsidy, public institutions have other sources of revenue. However, on average, the public subsidy still represents at least 90 percent of their revenues. To illustrate, average tuition at the three largest institutions in Mexico's capital city is less than \$10 per year. For the rest of the country, it is about \$100 on average. Universities' capacity to alter the political climate (i.e. student strikes and riots) had

prevented government from raising tuition. By contrast, private higher education institutions are not financially supported with public money.

Capacity expansion. The college aged population more than doubled between 1970 and 2005 from 4.03 million to 8.96 million and its share of total population increased from 8.36 to 8.68%. During the same period, enrollment in higher education institutions amazingly increased tenfold. As a result, a greater proportion of the population aged 20-24 gained access to tertiary education, from 5.18% to 24.19%. Based on Trow's model, the Mexican higher education system moved from elite to mass, a major accomplishment. However, more than 75% of the population eligible for higher education is still unable to access the system. Table 1 provides these statistics.

Table 1

Mexico's population and access to higher education

| YEAR | POPULATION | | | ENROLLMENT ¹ | ACCESS (%) |
|------|-------------|------------|-------|-------------------------|------------|
| | TOTAL | AGED 20-24 | | | |
| | | TOTAL | SHARE | | |
| 1970 | 48,225,238 | 4,032,341 | 8.36 | 208,944 | 5.18 |
| 1980 | 66,846,833 | 6,154,527 | 9.21 | 731,147 | 11.88 |
| 1990 | 81,249,645 | 7,829,163 | 9.64 | 1,078,191 | 13.77 |
| 2000 | 97,483,412 | 9,071,134 | 9.31 | 1,585,408 | 17.48 |
| 2005 | 103,263,388 | 8,964,629 | 8.68 | 2,168,510 | 24.19 |

¹It does not include graduate students.

Sources: Secretaría de Industria y Comercio, Dirección General de Estadística: IX censo General de Población. Instituto nacional de Estadística, Geografía e Informática, INEGI: X, XI, and XII Censo General de Población y Vivienda; II Censo de Población y Vivienda 2005. ANUIES: Anuarios Estadísticos 1970, 1980, 1990, 2000, and 2005.

Private institutions. The Universidad Autónoma de Guadalajara, founded in 1935, is the oldest private higher education institution in Mexico. Nevertheless, the participation of private institutions as providers of higher education is a more recent phenomenon. Just 18 years ago, 12 states did not have this type of institution. Today, private higher education institutions are found throughout the country. Their growth has helped alleviate the pressure for access to higher education. In fact, between 1980 and 2000 on a national level, the private sector grew 4.8 times more than the public sector. This accordingly allowed the increase in enrollment share from 13.5% to 29.4%. By 2005, it represented 33.2%. Hence, it is fair to say that the rise in access to higher education in Mexico was due primarily to the enrollment increase in private institutions.

It is noteworthy to mention that private sector has been heterogeneous. On one hand, there are a few large elite institutions offering good quality education at higher tuition rates ranging from \$4,500 to \$5,500 per semester. The Tecnológico de Monterrey belongs to this group. On the other hand, there are many small institutions with very limited resources, low tuition rates, and generally low in quality. These institutions usually are for-profit. Finally, the vast majority of private institutions focus on the transfer of knowledge instead of its production and use.

Between 1990 and 2001, 539 new higher education institutions were created of which 418 were private. With respect to new public institutions, the vast majority (107) were technological universities which began operating in 1991 and offer only two-year study programs.

Table 2 examines institutional size. In 2001, 75.8% of Mexican higher education institutions enrolled one thousand or fewer students. Furthermore, 77.0% of these institutions were private. Conversely, the largest institutions were predominantly public.

Table 2

Higher education institutions by sector and enrollment range in 2001

| ENROLLMENT | PUBLIC | PRIVATE | TOTAL | CUMULATIVE % |
|-------------|--------|---------|-------|--------------|
| 0-500 | 106 | 437 | 543 | 59.5 |
| 501-1000 | 53 | 96 | 149 | 75.8 |
| 1001-2500 | 47 | 62 | 109 | 87.8 |
| 2501-5000 | 40 | 19 | 59 | 94.3 |
| 5001-10000 | 12 | 13 | 25 | 97.0 |
| 10001-15000 | 5 | 1 | 6 | 97.7 |
| 15001-20000 | 2 | 1 | 3 | 98.1 |
| 20001-25000 | 4 | 1 | 5 | 98.6 |
| 25001-30000 | 5 | 0 | 5 | 99.1 |
| 30001-40000 | 1 | 1 | 2 | 99.3 |
| 40001-50000 | 2 | 0 | 2 | 99.5 |
| + 50000 | 4 | 1 | 5 | 100.0 |
| TOTAL | 281 | 632 | 913 | |

Note: The data are from table "Expansión y diversificación de la matrícula de la educación superior en México" Huáscar Taborga Torrico; 2003, ANUIES, p.165. México.

Although the Tecnológico de Monterrey is a large institution with a share of 8.5% in the undergraduate students enrolled at private institutions during the 2004-2005 academic year, its participation decreases to a modest 2.8% when compared to the total combined undergraduate population at both public and private institutions.

Graduate education. There is wide agreement among scholars that graduate education is critical to the pursuit of research. According to ANUIES (2005), the Mexican higher education system enrolled 142,480 graduate students during the 2004-2005 academic

year; doctoral students accounted for just 11,822 of that total. Moreover, the system conferred 1,717 doctoral degrees in 2004 (CONACYT, 2005). Placing these figures in an international context, the American higher education system enrolled 2.16 million graduate students during the same period, according to the National Center for Education Statistics (NCES). In an annual census of new doctorate recipients, the 2004 Survey of Earned Doctorates (SUD) found that universities in the U.S. awarded 42,155 doctorates during the 2003-2004 academic year. To make things worse, the gross domestic expenditure on research and development (R&D) in the U.S. was 2.68% of 2005 GDP compared to 0.44% in Mexico, the lowest among OECD members (OECD, 2006). No additional statistics are necessary to underscore the huge disparities between the two nations regarding their capacity for knowledge creation. Mexico's peripheral role in the advancement of knowledge is evident.

Within the Mexican context, the Tecnológico de Monterrey has been a marginal (i.e. peripheral) player so far regarding knowledge creation. Public universities are traditionally where research has been pursued. To illustrate, it is asserted that 95% of the scientific papers annually published by Mexican researchers are produced primarily at the Universidad Nacional Autónoma de México (UNAM) and the Universidad Autónoma Metropolitana (UAM) (SEP, 2003). Moreover, in 2004, the UNAM alone employed 26% of the 10,904 members of the *Sistema Nacional de Investigadores* (SNI), the most important peer review system of Mexican researchers (CONACYT, 2005). During the same period, faculty at the Tecnológico de Monterrey with membership in the SNI totaled 168 (Cantú, Cruz & Ramos, 2005). With respect to graduate students, the

institution enrolled 10,766 graduate students during the fall semester 2005 and accounted for 7.6% of the national enrollment; yet, no more than 200 of these students were pursuing doctoral degrees.

Based on the disadvantageous position of the Tecnológico de Monterrey just described, it would seem reasonable to state that the chances to achieve its research goals are very low. However, I am far from taking this statement for granted. Actually, having the institution as the focus of this study reflects that skepticism. The Tecnológico de Monterrey's long tradition of overcoming challenging situations as well as the leadership position it usually has assumed in Mexico supported the decision to study the situation. To illustrate, Esquivel (1988) underscores that the institution has been the first in a) including compulsory courses aimed at developing entrepreneurial skills among students in the high school and undergraduate curriculum (1984); b) requiring undergraduates to take computing courses (1964) and to perform community service (1995); c) establishing undergraduate majors as well as graduate programs in Computer Sciences (1968); d) joining BITNET (1986), predecessor to the Internet; e) using computers in learning evaluation (1975); f) the use of satellites to support the teaching learning process (1987); g) assessing faculty performance in the classroom through student-based surveys (1974); e) requiring all faculty to obtain at least a master's degree (1995); f) developing a multi-campus system across the nation (1967); and g) gaining accreditation from foreign agencies (1950), among many other achievements.

It can be argued that neither the institution's long history of success nor the prestige it has earned as a teaching university are relevant to the fulfillment of its research goal.

Nonetheless, it is also argued that the Tecnológico de Monterrey is engaging in this challenge as never before. Indeed, the institution's commitment to research is so important that it has become a central part of its mission. Furthermore, the official discourse urging everyone within the institution to contribute to the research goal has started to generate change. The evaluative nature of this study will help to assess how the referred change or its absence is contributing to the fulfillment of the Tecnológico de Monterrey research goal.

Significance of the study

Even though institutional drift is a phenomenon widely observed across American higher education institutions in decades past, its implications remain understudied. Under the knowledge economy, this phenomenon has strengthened and today is increasingly observed in other countries worldwide. Sadly, it has attracted even lesser attention from scholars. Therefore, conducting this study is important not only for the institution under study but for all higher education institutions already engaged or about to engage in changing their missions, specifically from teaching-oriented to research-oriented.

The methodological approach of this study will produce worthy insights about how people within the institution in question think and behave regarding the intended change. Consequently, this knowledge will allow the institution to assess the changing process and act to overcome obstacles to success.

Significant for this study is also the identification of the driving forces behind the institution's orientation towards conducting sponsored applied research as well as the

facilitators and inhibitors associated with the process. These findings will increase institutional awareness about the implications of the referred process of change.

Finally, this study also gains relevance from addressing stratification. Through abandoning their former teaching missions, higher education institutions may become more selective in their admission standards which may reflect a decrease in the enrollment of disadvantaged students. Stratification may also arise in different units within institutions as well as across institutions as a potential consequence of research engagement. Therefore, this study will illuminate our understanding of how stratification could may or may not be affected by institutional drift.

Organization of the study

This study is organized into six chapters. Chapter I introduced the study by offering context to the problem and identifying its significance to higher education. The study's research questions were also presented here. Additionally, a general description of the Mexican higher education system was provided along with a closer look at its private participants and graduate education and framed the operational setting of the institution selected for this study. Sensitive to the determinants of institutional drift, Chapter II reviews the scholarly literature relevant to this phenomenon. The literature is organized into three categories of determinants: external forces, institutional environment, and resource allocation practices. Furthermore, Chapter II details the three theories that constituted the theoretical framework of this research project. In addition to reintroducing the study research questions, Chapter III focuses on the research approach, the rationale implied in its selection, and the chosen strategy of inquiry. Justification for selection of

the site and sub-sites is included as well as for the sample population of the study. The chapter also addresses methods of data gathering and data analysis, the researcher's positionality, and the limitations of the study. Chapters IV and V present the major findings of the study. The chapters introduce the rationales and strategies behind the institution's commitment to research, reactions from people inside the institution, and some of the implications associated with the commitment. Chapter IV focuses on the institution's system level, whereas Chapter V gives attention to the campus level. Lastly, Chapter VI revisits the research questions based on the study findings. An assessment is also included regarding the helpfulness of the theories in explaining the institutional drift phenomenon. The chapter closes by presenting implications and recommendations for the institution as well as considerations regarding further research.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

The shift in mission from teaching-oriented to research-oriented and the adoption of the new paradigm of applicability for knowledge creation that higher education institutions are experiencing can be understood by looking at the context within which these institutions are operating. External forces, institutional environment, and resource allocation practices are elements of this context. They have been founded as highly correlated with the referred institutional behavior. In this chapter, the literature related to these determinants is presented in the same order in which they were introduced.

Literature regarding external forces

The knowledge economy

The concept of knowledge economy/society is not new. More than a decade ago, it was stated that knowledge had become the basic economic resource of a post-capitalist society. Those who possess, produce, and/or know how to profit from knowledge were identified as leading the knowledge society (Drucker, 1993). Considered as knowledge factories, universities are then seen as a useful asset of knowledge economy. However, such an economy urges universities to abandon their traditional way of producing knowledge through basic research and to embrace a newer role of collaborating with industry in the production and transfer of knowledge and technology (OECD, 1996). Consequently, knowledge economy policy increasingly tends to evaluate the worth of

knowledge along economic lines. This approach puts certain academic disciplines at risk of not receiving research funding.

Australia, an OECD member, has established policies that aim to make the country more competitive in the knowledge economy. It is asserted that these policies are also designed in accordance with the economic lines mentioned above by putting science, mathematics, and information technology in first place at the core. This is enough reason for some scholars to be convinced that the future of the arts and humanities in Australian universities is being compromised (Bullen, Robb, & Kenway, 2004). They blame government officials for adopting such a narrow science and technology focus and urge them to embrace better approaches that can be used as paradigms to determine how arts and humanities might respond to the challenges of the knowledge economy.

Institutional adaptability

The way higher education institutions deal with external forces urging them to change by adopting market-like behaviors can be explained through institutional adaptation. This concept conciliates both continuity and radical change these institutions have experienced during the last fifty years. Focusing on American public research universities, it points out that institutions' commitment to maintain their autonomy rather than being affected by other outside influences is what has led them to adopt market-like behaviors (Francis & Hampton, 1999). It is noteworthy to mention that institutional adaptation does not address the pros and cons of these market-like behaviors.

Aiming to test the institutional adaptation concept, Francis & Hampton (1999) quantitatively analyzed market-like behaviors in 55 public universities known as

Research I institutions (supposedly those more reluctant to change) during the 1989-90 and 1994-95 fiscal years. They utilized data from the Integrated Postsecondary Education Data System (IPEDS) surveys. Revenue and expenditure data were utilized as indicators of conditions and behaviors for the institutions under study. The findings supported the researchers' hypothesis that, when institutions are compelled to bear a higher share of educational costs through the use of nongovernmental sources, they end up expending more on one of those sources -students, in this case. Therefore, the change process in which public research universities engage allows them to adapt their mission to the new conditions and to reaffirm their institutional autonomy concomitantly.

Competitiveness

Slaughter and Rhoades (1996) posit that the U.S. competitiveness policy in place since the 1980s has impacted the way of conducting academic research and development (R&D). This policy resulted from the actions taken by a political bipartisan coalition developed in 1975 aiming to increase U.S. competitiveness in the world. Since then, American universities arguably have been moving their R&D efforts toward marketable science and technology, an orientation seen by this bipartisan coalition as one way to improve competitiveness. Under this competitive discourse, knowledge is valued mainly for its contribution to economic development. Slaughter and Rhoades state that the participation of university managers in the Business-Higher Education Forum, an organization founded in 1978 which includes leaders of large American corporations and universities' presidents among its membership, demonstrates their open support to the coalition's agenda. In order to assess the consequences of the referred competitiveness

policy on academic science and technology, Slaughter and Rhoades analyzed different data including national legislation passed in the 1980s and 1990s and related to the issue as well as science and technology indicators gathered by the National Science Foundation during the period between 1983 and 1993. They assert that competitiveness legislation allowed public universities to participate in the market making difficult to distinguish between public and private sectors. Based on that legislation, universities did not face bans on patent and profit from their discoveries. Moreover, tax exemption to universities' royalty income facilitated their incursion in the new endeavors.

Regarding the effects of the competitiveness R&D policy, these researchers identified a parallelism between the coalition's accomplishments and changes in academic science and technology. They found an increase in the proportion of federal funding allocated for applied research and an important shift of the funds from individual researcher to teams of researchers and/or research centers. The percentage of articles co-authored by industry and academic scientists also rose from 22 to 35 between 1981 and 1991. They found these trends congruent with the competitiveness rationale that emphasizes collaborative efforts as the most appropriate way for commercial exploitation of knowledge. The success of the competitiveness R&D policy was also judged based on the number of patents awarded to the top R&D performers among universities: it rose from 290 to 1,112 between 1980 and 1991. Finally, their findings pointed out that faculty salaries were unevenly affected by the referred policy: the salaries of those working in fields closer to the market grew significantly more than the rest of the faculty.

Institutional capitalism

The adoption of similar agendas for research and other policies regarding higher education throughout the world can be explained by institutional capitalism rather than simply by a shared desire of nations to remain competitive in the global economy. This theory claims that state welfare retrenchment has been induced by a network comprising the largest corporations in the world. Through placing business people in governing boards of higher education institutions as well as in the inner circle of politicians, this corporate network exerts control over the higher education agenda. Economic power is identified as the network's driving force. The U.S. "Business-Higher Education Forum" and the Canadian "Corporate-Higher Education Forum" exemplify powerful mechanisms for higher education alignment towards market in developed countries (Torres & Schugurensky, 2002). Regarding developing countries' alignment, the World Bank is mostly in charge. To illustrate, in its report *Constructing Knowledge Societies: New Challenges for Tertiary Education*, the organization applauds investment in higher education by praising the benefits it carries out including those resulting from research and technology development (p. 76). As part of the developing world, Latin American higher education is under pressure to conform accordingly: implementation of tuition fees in public universities, partnerships with the business sector, and the adoption of efficiency as the golden rule for measuring performance across university' activities (Torres & Schugurensky, 2002).

Recapitulating what has been presented in this section, it could be argued that either because of the knowledge economy, state retrenchment, competitiveness, or institutional

capitalism, higher education institutions worldwide are increasingly under pressure to conform according to economic and market principles. These demands not only put some academic disciplines at risk within higher education institutions but the fulfillment of their traditional missions as well. Nevertheless, they are gradually behaving in the way that external forces are requesting.

Literature regarding institutional environment

Culture of academic science

Desires for legitimacy and survival could lead an organization to behave and adopt a particular structure, both determined by its institutional environment (Tolbert, 1985). On the other hand, Hackett (1990) asserts that culture of academic science and structure within universities are intertwined and mutually reinforce one another. He defines culture of academic science as a set of seven values polarized along seven axes. The axes are analytically freestanding but interrelated; thus, change in one axis will affect the others. The values in continual tension are: freedom and autonomy versus accountability and explicit direction of scientific work, producing research versus educating students, local versus cosmopolitan orientation, quality versus quantity, specialization versus generalization, competition versus cooperation, and efficiency versus effectiveness.

In order to validate the statement that the culture of academic science and the structure within universities are being reshaped by the increasing dependence on resources from the private sector and/or government, Hackett (1990) conducted interviews with 26 renowned scientists from the biological sciences, two department chairs and eight academic administrators, all working in middle and top-ranked American

universities, and four agency officials. Their responses allowed Hackett to conclude that changes in the culture of academic science and structure within the universities will not cease, thereby putting universities closer to the practices and values of industry and government bureaucracies.

Institutional drift

Institutional drift refers to the increase on research and writing activities by professors at teaching-oriented higher education institutions as a result of mimicking their counterparts at research-oriented institutions. Drawing on data from three national college and university faculty surveys dated on 1972, 1989, and 1992 and representing 99 institutions from all types considered by the Carnegie Classification of Institutions of Higher Education, Milem, Berger, & Dey (2000) found that faculty at all four-year institutions spent more time conducting research during that 20 year period. Remarkably, faculty at doctoral and comprehensive universities showed the largest proportional increase. It was speculated that the prevailing academic reward system which emphasizes research could partially explain these results. The findings from this study suggest the existence of some mechanism that translates organizational orientation (i.e. closeness to the market) into patterns of individual behavior among faculty.

Mission creep

The term *mission creep* refers to the expansion of a mission beyond its original goals. Originally applied to military operations, the use of the term in higher education started around 1995. It carries a negative connotation and in higher education is utilized to identify those institutions within the field that are supposedly neglecting their original

mission through mission creep. Contestable regarding its driving forces, the mission creep phenomenon is increasingly observed among higher education institutions seeking more prestige regardless of type.

Research conducted on mission creep within higher education can be grouped into four categories based on the different forms the phenomenon could manifest: mission creep at community colleges, mission creep at state colleges and universities, mission creep in colleges becoming universities, and mission creep at comprehensive universities. In the same order, each of these forms is presented next.

Mission creep at community colleges. Positing that nowadays they are called to provide the skilled workforce needed to be competitive in a global economy; some community colleges have begun to grant baccalaureate degrees. This phenomenon is known as *community college baccalaureate* and it is rapidly gaining advocates. There is even a Community College Baccalaureate Association (CCBA) which was established in 1999. Its main purpose is to promote better access to the baccalaureate degree at community college campuses. The association sustains that every person should have an opportunity to pursue a baccalaureate degree in order to access well-paid jobs and that community colleges, because of their convenient location, open-doors admission policy and affordability, are the right institutions to offer that opportunity.

Opponents to the community college baccalaureate movement labeled the idea as bad and not new, claiming that those who did so in the past no longer exist as community colleges and also failed to improve access to higher education for the communities they

were created to serve. Moreover, bachelor's degrees granted by community colleges are condemned to be second-class degrees (Wattenbarger, 2000).

The community college baccalaureate phenomenon has also been described as mission creep: an intrusion into the four-year institution domain and a betrayal of the community colleges' original mission. Contrary to this assessment, Martin & Samels (2002) argue that, through offering baccalaureate degrees, community colleges are simply meeting their destiny; that they are responding to the demands on regional workforce development and access to higher education for fast growing populations who are not interested in traditional colleges or universities. Walker (2001), who was a community college president for 27 years, adds that community colleges offering baccalaureate degrees are serving their students better rather than shifting mission. He states that it is not the mission of the community college to serve its students for two years but to prepare them for the job market, emphasizing that the baccalaureate degree is becoming increasingly the entry level to that market.

Mission creep at state colleges and universities. Not only are community colleges being accused of neglecting their mission. State colleges are in the spotlight, too. Aiming to improve their reputations, an increasing number of regional public state colleges are opening honors programs (Selingo, 2002). Through this strategy, these institutions are enrolling talented students who otherwise would attend more prestigious institutions. In addition to the talented students, honors programs concentrate the best professors as well as other type of resources, raising concerns about the two-tier systems that these programs could be creating. Consequently, the establishment of honors programs can be

considered as mission creep as well as a source of further stratification (Bastedo & Gumport, 2003).

Despite encountering opposition from their state legislatures, more public state universities are aspiring to become national research universities (Arnone, 2003). These universities justify their aspirations asserting that research universities act as detonators for economic development in the regions where they are located. Nonetheless, they seem unaware that becoming a research university is not an easy enterprise. Better ranked institutions fiercely defend their positions against anyone wanting to join them. To the referred public state universities, this translates into challenges they would not otherwise face, opens the possibility of failing to fulfill their regional mission and sets the scene for mission creep.

From a different perspective, American colleges and universities are also neglecting their mission when directing their actions to compete for institutional prestige and revenues instead of serving the public good (Newman, Couturier, & Scurry, 2004). On the one hand, these institutions end up developing low-quality and unneeded Ph. D. programs based on their paradigm that becoming research universities will result in greater prestige for them. On the other hand, their search for revenues puts at risk the integrity of research when the funding is derived from closer links with industry. Thus, the hunt for prestige and revenues in this case leads institutions to again engage in mission creep.

Mission creep in colleges becoming universities. For a considerable number of colleges, mission creep begins when they decide to rename themselves as universities.

Aiming to identify the similarities among institutions that made the conversion from college to university, Morpew (2000) studied 105 of the 124 four-year institutions that changed their name between the 1989-1990 and 1997-1998 academic years. Based on institutional theory, he hypothesized that less selective postsecondary institutions were more likely than their more selective peers to change their names from colleges to universities. Institutional selectivity was measured using the 1990 *Peterson's Guide to Four-year Colleges* (20th ed.) which ranks four-year postsecondary institutions into one of five categories according to certain characteristics of students admitted. The findings strongly supported the researcher's hypothesis because none of the institutions that changed their names were classified among the two most selective categories of the Peterson's Guide. Hence, less selective institutions are more likely than selective institutions to change their names from colleges to universities, and through that to engage in mission creep. Even though name change reflects a need for prestige through the lens of institutional theory, Morpew urges qualitative research that focuses on why colleges could become universities and the impact within the institution this transformation could have.

Mission creep at comprehensive universities. Prestige also appears to be a good enough reason for mission creep at comprehensive universities and colleges. Based on the 1976, 1987, and 1994 editions of the Carnegie Classification of Institutions of Higher Education, Aldersley (1995) identified institutions that exhibited 'upward drift' during the period under study. Upward drift refers to an institution's advancement into 'upper' categories within the Carnegie classification. Aldersley argues that institutions believe

that higher prestige is attached to upward drift. Remarkably, the Carnegie classification categorizes American higher education institutions sharing similar characteristics but prestige has never been included as one of those characteristics. The classification allegedly does not intend to be a portrait of the hierarchy among the included institutions. On the other hand, advancing towards upper categories does not necessarily bring to the institution in question any of the additional resources needed to fulfill the mission associated with the new category.

Aldersley's findings show that 42 institutions move up between 1976 and 1994 within the Carnegie's different categories from being *Comprehensive Universities and Colleges I* to becoming doctoral-oriented institutions: *Doctoral Universities II*, *Doctoral Universities I*, *Research Universities II*, or *Research Universities I* in ascending order. Moreover, he also found that upward drift did not end after an institution moved into the doctoral-oriented category. The institution kept moving up, perhaps striving to become *Research University I* as its ultimate goal. From all of the above, it can be said that upward drift is not the same as mission creep, but is at least a determinant of it.

Finally, among the many things that upward drift can affect within the institutions experiencing it, particular attention in future research should be paid to the possible impact on stratification.

In sum, the literature regarding institutional environment suggest that organizational structure and the culture of academic science within higher education institutions may be shaped by other organizations with which these institutions interact. On the other hand, changes in the external orientation of a higher education institution affect patterns of

individual behavior among its faculty as well as motivate the institution to abandon its original mission and replace it with another that is congruent with the new orientation. The shift is also likely to cause restratification within the institution.

Literature regarding resource allocation

The literature reviewed until now has demonstrated that the market-like behaviors increasingly observed in higher education institutions worldwide threatens the existence of some academic disciplines and even puts these institutions at risk of failing to fulfill their original mission. It has also been reviewed that the change process in higher education institutions is reshaping individual behaviors among their people, the culture of academic science and their organizational structure. Nonetheless, the criteria utilized for allocating resources within these institutions deserves special attention due to the critical role it plays in the change process. Hence, a brief review of three variables often included as part of the referred criteria is presented next: power, rationality, and prestige.

Power

The Weberian definition of power sees it as the ability to control others, events, or resources to make happen what those in power want to happen in spite of obstacles, resistance, or opposition. Therefore, people possessing power within an organization might utilize it to influence decisions regarding resource allocation (Pfeffer, 1981).

Universities require a variety of resources to function. They are not equally important; some are critical while others are difficult to obtain. When power differences exist between subunits within higher education institutions (i.e. horizontal power differences), those who can provide resources that are most critical and difficult to obtain

rise to power, influencing the allocation of resources accordingly (Pfeffer & Salancik, 1974).

From studying the resource allocation process at the University of Illinois in 1972, Pfeffer & Salancik (1974) concluded that power determined the amount of resources allocated to an academic department rather than departmental workload or student demand for course offerings. The study considered annual budget data from the period between 1958 and 1970 related to 29 university departments representing the vast majority of the university's colleges. Measurement of subunit (i.e. departmental) power relied on three variables: 1) an interview-based rating of the power for each subunit [the rating was determined by the heads of the 29 departments considered in the study]; 2) subunit representation on important university committees; and 3) subunit membership on the University Research Board. In addition to the main finding, the researchers also asserted that more power might be used by academic departments in the resource allocation process when extra funds are provided in the form of grants and contracts to these departments.

Salancik & Pfeffer (1974) further studied the University of Illinois, this time examining in greater detail at the factors which led to power differences between subunits and the conditions under which power was utilized to affect the allocation of resources within the institution. Within their study, horizontal power is defined as "the use of influence among co-acting peers to obtain benefits for themselves" (p. 453), and deemed as an important mechanism used to influence resource allocations. Additionally, their analysis of power considers organizations as political coalitions, a view borrowed from

Cyert & March (March, 1962). Under this perspective, organization's composition and goals are not given but negotiated. Participants in this type of organization make demands on the organization as their price to participate in the coalition. Finally, the coalition model of organizations emphasizes the differences between these demands and concentrates on how they are resolved.

Regarding the bases of subunit power, as in their previous study aimed at the University of Illinois, the researchers hypothesized that those departments providing the university with critical, important, or valued resources acquire more power than the other departments. To test the hypothesis, they ran statistical regressions using subunit power as the dependent variable. Independent variables included subunit resource contribution to the university and the importance of the resources provided. Subunit power was identically measured as in the study mentioned above. On the other hand, subunit resource contribution was estimated based on historical data about the proportion of total grants and contracts received by each department as well as the proportion of undergraduate and graduate students they individually taught. Each department's national ranking was also considered. The estimation also included an assessment of each department's contribution to seven selected resources within the university. The importance of those seven resources to the university was also assessed. Both assessments were done by the departments' chairperson. The ranking focused on two dimensions: the importance that the department assigned to each of the seven resources and the importance that the university as a whole assigned to the same resources. The study's findings indicate that outside funding was the best predictor of department power,

contradicting the department chairperson's judgment that graduate students and national prestige are the best predictors.

Regarding the circumstances under which subunits will exercise their power to influence the allocation of resources for their benefit, Salancik & Pfeffer hypothesized that resource scarcity and criticality quintessence the circumstances. In order to test the hypothesis, scarcity was measured again through an interview-based ranking of the following seven resources: Graduate university fellowships, Research Board grants, Appointments to the Center for Advanced Study, summer faculty fellowships, computer money for faculty research, computer money for instructional use, and new courses. The same interview-based ranking approach was used to estimate resource criticality, defined as the extent to which each of the seven resources was absolutely necessary for the effective operation of the department in question. The findings showed that power is most highly correlated with allocations for university graduate fellowships, followed by grant allocations for faculty research. Faculty research grants and graduate university fellowships are paid positions allocated to each department by the Graduate College and funded through discretionary funds. As a corollary from the study, Salancik & Pfeffer state that "power derived from acquiring resources is used to obtain more resources, which in turn can be employed to produce more power –the rich get richer" (p.470). Specifically, bringing in outside resources to the institution translates to preference when acquiring internal resources.

The coalition model of organizations has been also tested by other researchers. Hills & Mahoney (1978) explored whether the coalitional model or the bureaucratic model of

budgeting better explained the budget decisions made within a university. Bureaucratic models of budgeting assume rationality in budgeting behavior whereby optimal resource allocation is achieved. Contrary to the coalitional, this model does not consider the exertion of power in budget allocation decisions. The researchers hypothesized that, under conditions of relative abundance of resources, universalistic criteria rather than power determine budget increments received by departments within a university. The opposite would be expected under conditions of relative scarcity of resources.

Using archival data, the hypothesis was tested through multiple regression analysis of budget allocations to 30 academic departments of the University of Minnesota from 1964 through 1975. Between these years, the university experienced relative abundance and relative scarcity of resources based on the appropriations it received from the state legislature.

Budget allocations to university subunits were considered as the dependent variable and measured by discretionary budget increment. Relative workload, change in overall workload, and power were the independent variables. Relative workload of a subunit was measured as student credit hours weighted by level of instruction per full-time equivalent faculty. Power was measured through: 1) subunit participation in the University Senate; 2) subunit affiliation with external advisory boards; and 3) the amount of matching funds granted a subunit from an external source. The study results demonstrated that, during scarcity, power drawn from external advisory boards was the predominant influence in the allocation of incremental discretionary resources. On the other hand, during abundance, relative workload best explained the allocation of incremental discretionary

resources. Based on their findings, Hills & Mahoney suggest that a university's behavior is best explained by the coalition model and is best exemplified when resources are scarce and powerful subunits disproportionately accrued those resources.

Confirming Pfeffer and Salancik's findings, Volk, Slaughter, & Thomas (2001) concluded that departments receiving grants and contracts tended to be better funded than the rest. The assertion derives from a study focused on the amount of state appropriated dollars to nearly all of the departments of a Research I university during the 1992 fiscal year. It was also concluded that current models of resource allocation are unable to fully explain complex organizations like universities with multiple missions focusing on different markets.

Rationality

The decisions regarding resource allocation become critical when available organizational resources are decreased. Rationality can be the criterion to utilize under retrenchment within universities. In addition, the fact that rationality is a socially embedded value in Western societies favors its use. Based on these statements, Ashar & Shapiro (1990) conducted a study aimed at explaining retrenchment decisions that affected 40 departments at a large, public, urban university located in the northwest. The study focused on university decisions made between 1980 and 1982. The researcher found a systematic relationship between objective, evaluative data and policy decisions during the analyzed period. This supports the hypothesis that under environmental scrutiny for the use of scarce resources the rational choice model is observed. However,

the researchers acknowledge that the exclusion of power as a variable into their model could have explained the allocation process.

Prestige

By using data from cases dealing with retrenchment reported between 1980 and 1990 in *Academe*, the journal of the American Association of University Professors (AAUP), Slaughter (1993) investigated who controlled that process, where the cuts were made and why. 196 cases of faculty retrenchment were analyzed. She concluded that the whole process reflected changes in wealth and power in the wider society. Therefore, it was not really retrenchment but restructuring. She found that resources reduced in some fields were diverted to other fields already rich in resources. However, productivity was invoked as the criterion for determining the cuts. Finally, it was argued that fields supposedly closer to the market and enjoying prestige generally did not experience any resource reductions.

Summarizing, scholarly research on how resources are allocated within organizations stresses that those who possess power within higher education institutions are in position to greatly influence the decisions regarding resource allocation. Power may become so important that it could even substitute rationality in the allocation process. On the other hand, prestige also gives advantages during the resource allocation process to those units possessing it. Although not explicitly addressed, the way resources are allocated has important implications on stratification too, usually perpetuating pre-existing inequalities across and within organizational units.

Theoretical frameworks

Three theories were employed in this study to clearly identify and fully explain the reasons for steering the institution object of this study towards focusing on revenue-generating research as part of its mission. The theories are: 1) academic capitalism, 2) institutional theory, and 3) Hackman's theory of resource allocation. The study addressed the selected institution at two different levels of analysis: organizational and campus. The former level studied the institution as a whole whereas the latter concentrated on campuses as its elements. Academic capitalism was used for the analysis of the organization while the analysis of campus relied on Hackman's theory of resource allocation. Institutional theory was utilized in both levels of analysis. Next, each of the three theories is presented in the same order they were mentioned.

Academic capitalism

Its creators refer to academic capitalism as market or market-like efforts observed by people inside public and nonprofit colleges and universities aimed at securing external revenues. For them, these behaviors are conducive to the encroachment of the profit motive into academia (Slaughter & Leslie, 1997; Slaughter & Rhoades, 2004).

The knowledge economy coupled with the neoliberal state and globalization help in framing academic capitalism. Knowledge-based economies focus primarily on using knowledge to produce economic benefits. Consequently, knowledge becomes a raw material categorized as a marketable commodity in the economy. Under this perspective, universities acquire great relevance because they traditionally have been sources of knowledge creation. Moreover, due to its commercial possibilities, applied research

rather than basic research is now in the foreground. Hence, in many ways, universities are crucial to the knowledge economy. On the other hand, it is argued that governmental policies resulted from abandoning the welfare state paradigm have encouraged colleges and universities to actively seek partnerships with the private sector in an attempt to compensate for diminishing state allocations. In other words, by deliberately promoting the knowledge economy, the neoliberal state has established favorable conditions for academic capitalism development. Nevertheless, Slaughter and Rhoades (2004) stress that there is no causality between the knowledge economy and academic capitalism and that colleges and universities can afford alternatives different from academic capitalism in order to link with the knowledge economy.

The theory of academic capitalism is intended to rationalize the mechanisms that colleges and universities utilize to integrate into the knowledge economy (Slaughter & Rhoades, 2004). Academic capitalism pays particular attention to the different ways faculty, students, administrators, and academic professionals use a variety of state resources to link higher education institutions to the knowledge economy. According to academic capitalism, the universities' communities are active players in the marketplace when seeking and securing external revenue streams. The theory underscores that, in order to succeed in this endeavor, universities' communities create new circuits of knowledge, favor the emergence of units aimed at the generation of external revenues, willingly participate in networks connecting public and private sectors, and endow their administrators with the necessary power to engage the market.

For Slaughter and Rhoades (2004), embracing an academic capitalist knowledge/learning regime at least partially implies abandonment of the public good knowledge/learning regime. The shift is not trivial when taking into account the values associated with the public good regime. A public good regime stands against secrecy in science, conducting science based on its commercial possibilities, impeding universal knowledge flow, encouraging scientists to adopt partisan postures regarding knowledge, and having research findings unchallenged by scientists. Therefore, the public good regime is conducive to freestanding academic science. On the contrary, the academic capitalist regime leads universities to compromise this distinctive characteristic by encouraging academic science to do whatever it takes in order to obtain external resources. The establishment of university technology parks, technology transfer and development offices, business incubators as well as university's involvement in start-up and spin-off companies illustrates some of the alternatives aimed at this goal.

Slaughter and Rhoades (2004) make a case against academic capitalism by arguing that it translates into competition among and restratification of academic fields. Universities following the academic capitalism premise emphasize wealth creation as the criterion to allocate resources among its organizational units. In the competition for resources, academic units within universities often develop professional Master's degrees, contract education, and certification programs judged as appropriate for the knowledge economy. Whether considered as cost or profit centers, academic units now devote special attention to productivity and efficiency from an economic perspective. On

the other hand, the capacity for each academic field to intersect the knowledge economy translates into unequal competition and consequently results in restratification.

Although academic capitalism is still in the early stages at Mexican universities (Ibarra, 2002), this study will demonstrate how organizational behavior and structure at the studied institution are currently similar to universities in the U.S. where academic capitalism is already observed.

Institutional theory

Institutional isomorphism constitutes the specific concept drawn from institutional theory for the purpose of this study. Rather than portraying organizations as tightly bound entities with clearly defined boundaries distinguishing them from the surrounding environment, institutional theory conceives organizations as open systems connected to and constructed by wider social environments. It focuses on the relationship between the organization and the environment. Hence, institutional theory visualizes changes in an organization's formal structures as reactions to environmental changes, which includes all those within and even across the organizational field to which it belongs (Rhoades, 1992).

The concept of institutional isomorphism was first advanced by DiMaggio and Powell (1983). It focuses on the process by which organizations/units within a structured organizational field become similar to one another. Indeed, it is argued that highly structured organizational fields provide a context in which uncertainty and constraint lead to homogeneity. The principle of isomorphism was first applied to organizations by human ecologist Amos Hawley (1968), who posited that "units subject to the same

environmental conditions, or to environmental conditions as mediated through a given key unit, acquire a similar form of organization” (p. 334). Along with other ecologists, Hawley asserted that isomorphism stem from competitive processes in which organizations engage by responding to their need to assume the most suitable structure for thriving in a particular environment. Conversely, DiMaggio and Powell (1983) state that efficiency considerations do not determine the structures that organizations develop along the homogenization process. Instead, their development is a function of the organization’s efforts to acquire external legitimacy. Borrowing from Suchman (1995), legitimacy “is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs, and definitions,” a definition for the concept that explicitly incorporates the role of the social audience legitimation dynamics. External legitimacy conveys social acceptability and credibility or social fitness (Scott, 2001). Therefore, the concept of organizational saga –associated with internal legitimacy- is irrelevant in explaining institutional isomorphism. On the other hand, it is noteworthy to mention that no references to institutional isomorphism in an international context were found in the literature.

Institutional isomorphic change works through three mechanisms: coercive isomorphism, mimetic isomorphism, and normative isomorphism. Coercive isomorphism results from: a) both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and b) by cultural, societal expectations within which organizations function. Nowadays, obtaining certification or accreditation

by state agencies and professional associations is critical for organizations because it translates into legitimacy. Compliance with standard operating procedures and rules imposed by these organizations is conducive to isomorphism.

Recognizing that not all institutional isomorphic change results from coercive isomorphism, this theory introduces mimetic isomorphism as an additional mechanism that additionally encourages imitation. It appears when the environment creates symbolic uncertainty or when an organization faces a problem with ambiguous causes or unclear solutions. Hence, some organizations lacking defined processes or technologies to cope with problematic situations are likely to adopt a mimetic mechanism that imitates other organizations considered successful and/or more legitimate. In addition, either a skilled labor force or a broad customer base may encourage mimetic isomorphism. The wider the population of personnel employed by or customers served by an organization, the stronger the pressure felt by the organization to provide the programs and services offered by other organizations.

The last mechanism for institutional isomorphic change is normative and stems primarily from professionalization. It refers to the collective struggle of occupational members to define the conditions and methods of their work, to control “the production of producers”, and to establish a cognitive base and legitimate their occupational autonomy. When various professionals within an organization differ from one another, they tend to exhibit a similarity to their professional counterparts in other organizations. Professional mobility increases the pressure on organizations to become more and more alike over time. Within universities, these professionals are predominantly the faculty.

Hackman's theory of resource allocation

In this study, another way to approach the object institution's commitment to revenue generating research as part of its mission is through Hackman's theory of resource allocation in colleges and universities. This research-based theory was introduced to describe the allocation of resources among units of the same campus within an institution. This study tested that theory to understand the allocation of resources across campuses within the Tecnológico de Monterrey as well as across units within each of the institution's two campuses considered here. Moreover, the theory was developed for explaining budgetary gains and losses in times of financial difficulty, which was not the case neither for the Tecnológico de Monterrey as a whole or for its Querétaro campus.

Hackman (1985) built her theory on the assumption borrowed from institutional theorists that colleges and universities are open social systems interacting with their environment. Indeed, one of the theory's key concepts is that the inclusion of environmental power derives from this vision of a university. Nonetheless, the crucial concept introduced by Hackman was centrality, which refers to how closely a unit's purposes are aligned with those central to the organization. This closeness affects the interaction among the other four theoretical concepts: internal resource allocations, environmental power, institutional power, and resource negotiation strategies. In this theory, environmental power represents a unit's relative ability to bring in outside resources critical to the institution. On the other hand, institutional power is defined as the unit's relative influence within the institution, independent of its environmental

power; while resource negotiation strategies refer to the tactics used by unit heads to acquire resource allocations.

It is noteworthy to mention that Hackman included prestige among the environmental resources whose acquisition presumably grants environmental power to a unit. Therefore, the more prestige a unit acquires, the more environmental power that unit will possess. This proposition gains relevance given that prestige was one of my preliminary answers to the question of why the institution targeted by this study began to and increasingly has continued to allocate resources for revenue-generating research.

Based on all of the above, the theory's primary claim is that a unit's centrality combined with its environmental power and resource negotiation strategies determines the resource allocations acquired from the organization. It is also stated that a unit's institutional power independently affects its internal resource allocations (p. 72). The theory also points out that a unit's ability to acquire external resources is, by far, the predominant explanation of programs growth; consequently, a decrease in such power is the primary reason for decline.

The decisive role of a unit's centrality upon internal resource allocation has also been underscored by Rhoades and Slaughter (1997). Based on their study of several cases in various higher education institutions, they concluded that administrator decisions regarding downsizing and/or retrenchment are based on the assessed unit's centrality in relation to the institutional mission and goals; centrality is valued more than merit and quality.

The power implications embedded within centrality are fully recognized in Hackman's theory. Actually, she relies on Emerson's (1962) concept of relational power which stresses that power is meaningless when considered outside social relationships. To Emerson, power is present in the ties of mutual dependence which bind either persons or groups together in social systems. He asserts that "power resides implicitly in the other's dependence" (p.32). Hence, applying this proposition to the higher education context, it is fair to say that the greater the dependence of a university on a particular unit, the greater the power that unit acquires within the university. Consequently, a unit's centrality reflects its power within the university and/or campus, particularly in the case of this study. Finally, the power of a unit will prevail as long as the university's inability to substitute the resources supplied by the unit remains unalterable, *ceteris paribus*.

Conclusions

The literature reviewed in this chapter underscores the importance of context on the adoption of certain organizational structures by open social systems such as universities. It was also pointed out that the acquisition of power within universities greatly predicts the fate of those possessing it. The theories selected to study the Tecnológico de Monterrey's increasing engagement in sponsored, applied research take into consideration all the above and translates into adopting a holistic approach to the problem.

The theory of academic capitalism provides a framework to assess the research strategy implemented by the institution under study and whether the mechanisms and behaviors associated with the academic capitalist regime are embedded. Moreover, the

theory is very helpful in shedding light on the potential implications of academic capitalism related to stratification within the Tecnológico de Monterrey. On the other hand, institutional theory offers a foundation for identifying the degree of isomorphic change, if any, in the reorientation process that the institution is undergoing. Lastly, through the lenses provided by Hackman's theory of resource allocation, the impact on resource allocation across and within its campuses resulted from the institution's engagement in research can be assessed.

CHAPTER III: METHODS

Introduction

This chapter reintroduces the research questions as a means of narrowing the purpose of this study, which is to explore the rationale and strategies associated with increasing engagement in sponsored, applied research in a private Mexican university system. The resistance and commitment of people within this institution regarding its research orientation are also addressed. Furthermore, the study focuses on the capacity required to fulfill the research goal as well as on the stratification across the organizational units within the institution that may result from this process. Next, the research approach, the rationale implied in its selection, and the strategy of inquiry chosen for this study are offered. Then, a justification for the site selection, sub-sites as well as for the sample population of the study is included. In addition, the researcher's position in relation to the research project is discussed. Furthermore, the methods of collecting data and the way the data were analyzed are explained. The chapter concludes by pointing out the most important limitations of the study.

Research questions

Taken together, research questions should formally express the researcher's intellectual inquiry. They also capture the essence of the intended research (Mason, 1996), make the study's theoretical assumptions more explicit and set some limits to its analysis (Miles & Huberman, 1994). Nonetheless, research question proliferation may prevent the researcher from achieving the study's goals. A small number of research

questions and the use of sub-questions are suggested instead (Miles & Huberman, 1994; Wengraf, 2001). Thus, three research questions with some sub-questions were developed for this study. They are:

1. What are the rationales and strategies behind the institution's orientation towards conducting sponsored applied research?
 - 1.1. To what extent is that orientation being realized?
 - 1.2. What sources of support/resistance to the research orientation are evident?

2. To what extent are people within the institution resistant or committed to its research goal?
 - 2.1. What kind of research, if any, do they believe the institution should conduct?

3. How feasible is fulfillment of the research goal?
 - 3.1. Do people within the institution believe that the institution has enough resources to undertake the research challenge?
 - 3.2. Do people within the institution anticipate/see greater stratification among campuses as a result of the research orientation?

The first question addresses the reasons behind the institution's commitment to research as well as the strategies associated with it. Concepts like power, prestige, centrality, legitimacy, and closeness to the market may arise explicitly or implicitly from the answers to this question as an indication that academic capitalism and/or institutional theory are acting on the institution's research orientation. The identification of possible inhibitors to that orientation is also a goal of this question.

The second question acknowledges the possibility of disagreement among people within the institution about the intended research goal. Disagreement at any level could

be rooted in people's understanding of research or the kind of research they believe the institution should conduct, if any.

Lastly, the third question focuses on the feasibility that the research goal will succeed. People within the institution could disagree about the institution's readiness to undertake its research goal. This question also considers the possibility of stratification within the institution reflected in dissimilar contributions across different campus sites as well as across the academic units within each campus as a result of the research orientation. The findings for this question were contrasted with Hackman's theory of resource allocation and with academic capitalism, both theories which are part of the theoretical framework of this study.

Overall approach

Good research is good research, regardless of the method of inquiry (Phillips, 1990). There is also agreement that a qualitative research approach can be used to test or further explicate a conceptualization or theory (Miles & Huberman, 1994) which was the case in this research project. Moreover, in qualitative research, the researcher is the key instrument to collecting data as well as to capturing the participants' perspectives regarding what is being studied (Bogdan & Knopp, 1998), two key issues to properly address the research questions for this study. Thus, case study was the selected strategy of inquiry utilized as part of the qualitative approach. Although there is not total agreement among scholars on the definition of a case study, most concur that a case study is best suited for systems with clear boundaries (Creswell, 1998) and the institutional target of this study met that criterion. As an empirical enquiry, a case study also

addresses a phenomenon within its real life context (Yin, 1989), a goal additionally intended for this research project. Regarding its type, the case study on which this study was based is interpretive as well as evaluative. It is interpretive because the data gathered was utilized to support the study's theoretical framework and evaluative because the referred data supported judgment (Merriam, 2001).

Site selection

The institution selected for this study was the Tecnológico de Monterrey, a Mexican private nonprofit, highly selective, comprehensive university with 33 campus sites in 28 different cities. The largest of its type in Mexico, Tecnológico de Monterrey was founded in 1943 by a group of businessmen to alleviate the shortage of middle managers and engineers in the city and in Mexico in general (Elizondo, 2003). At that time, the shortage was a consequence of the imports substitution approach followed by Mexico as its model of economic development. Since its inception, the institution operates under the statute of a Free University and it is not linked to any political party or religious group.

The business orientation of its founders greatly influenced the nature of the academic programs first offered by the institution, its organizational structure, its performance evaluation criteria, and even the titles associated with various positions. Indeed, it was not until 15 years after its foundation that the institution changed the title of its highest authority from general manager to rector (Elizondo, 2003). Entrepreneurship is another distinctive characteristic which can be traced back to the institution's origins. In fact, its fourth principle states that "True to its origins, Tecnológico de Monterrey promotes

entrepreneurship and the creation and development of business enterprises with social responsibility in a market economy environment” (Tecnológico de Monterrey, 2005a).

Each of the Tecnológico de Monterrey campuses is supported by a civil association made up of community leaders committed to higher education. In addition, the expansion of both the institution’s scholarship program and its physical infrastructure rely on community participation in raffles organized by the institution since 1947. The financial resources obtained from these raffles and consistent compliance with the institution’s principle of economic sustainability together constitute the pillars that keep the institution financially viable. To be precise, the referred principle states that:

Tecnológico de Monterrey’s operation, growth, and innovation are based on economic sustainability. The operating budgets of the campuses, diverse entities, and projects in general should always produce a surplus in order to guarantee the future of the institution. Faculty, employees, directors, and trustees, in their respective areas, contribute to the growth of Tecnológico de Monterrey and to the efficient administration of its resources (Tecnológico de Monterrey, 2005a).

It is noteworthy to mention that tuition is the most important revenue stream in the campuses’ operating budgets.

The Tecnológico de Monterrey is organized in seven zone presidencies and four vice-presidencies, all reporting directly to the institution’s system president. The 33 campuses are linked to a specific zone; each has a campus president who reports directly to the zone president. As a whole, the Tecnológico de Monterrey offers 3 high school programs, 37 undergraduate majors, 21 specializations, 53 master’s programs, and 10 doctorates. Enrollment during the fall semester 2005 was 28,613 high school, 56,398 undergraduate, and 10,766 graduate students. In the same period, its faculty comprised 2,984 full-time and 5,194 part-time professors. The academic programs of the institution are nationally

and internationally accredited. Actually, it was first accredited in 1950 by the Southern Association of Colleges and Schools' (SACS) Commission on Colleges of the U.S. to grant undergraduate, master's, and doctoral degrees. Lastly, it is important to mention that the institution's high school population was considered not relevant to this research study and findings contained herein.

The institution has agreements with 723 higher education institutions worldwide for faculty and students exchange as well as for the pursuit of academic and research programs. Moreover, it offers 29 international undergraduate majors. According to the institution's statistics, 6,693 Tec students spent at least one academic period abroad during 2005. Conversely, 4,174 students from abroad studied at the institution during the same period. Furthermore, the Tecnológico de Monterrey has 12 branch offices in six different countries.

To contribute to the development and integration of Spanish-speaking communities within Mexico and abroad, the institution established a Virtual University in 1989. It currently offers academic programs via online, satellite, or both modalities to eight countries, mostly in Latin America. Academic programs offered are primarily comprised of certificate and continuing education programs, although 14 master's degree and one doctorate degree are also included. In addition, the entire faculty who teach graduate programs have earned a Ph.D. degree and are mostly located at either the Monterrey or Estado de Mexico campuses, where the Virtual University courses are broadcast regularly. Remarkably, the Virtual University is also accredited by SACS. With respect

to its student body, enrollment during 2005 for graduate programs was 6,016 students and 65,926 people were enrolled in continuing education programs.

Focusing primarily on the middle-income population, the Tecnológico de Monterrey created the TecMilenio University in 2002. It aims to develop professional skills in its students as a means of enabling them to rapidly enter the labor market. Currently, TecMilenio has 30 campuses nationwide and enrolls approximately 15,000 students.

Lastly, the Tecnológico de Monterrey has been conducting sponsored, applied research as part of its mission since 1985. This research orientation has been renewed again in its current mission released in February 2005. It is asserted by the institution that it promotes the integration of the country and its regions into the knowledge economy through its research centers. Moreover, aiming to achieve this goal, only eight of the institution's campus sites have been officially declared as research oriented. Although there is not a ban on other sites, the rest of the campuses are not expected to engage in research activities.

Sub-sites selection

As Yin (1984) points out, cases may contain sub-cases within them. In accordance with this possibility, the fieldwork for this study focused on two of the institution's campus sites, one of which is labeled as research oriented. The decision regarding which of the eight research-oriented campuses could better serve the interests of this study was based on the possibilities that each campus had to effectively contribute to the fulfillment of the institution's research strategy. It was presumed that large campuses with plentiful research resources would successfully engage in research. Nonetheless, this researcher

concluded that focusing on at least one large campus where research was less feasible would serve the purpose of this particular study.

Based on the defined criteria for selecting a research-oriented campus, the Monterrey, Estado de Mexico, and Ciudad de Mexico campuses were discarded. The reasons supporting this decision follow. These campuses represent the largest populations of both undergraduate and graduate students and their combined student enrollment in these two categories represents 51.5% of the corresponding institution's total population enrolled during the fall semester 2005. The figures are similar with respect to faculty trained in research at these three campuses: they employed 56.3% of the institution's faculty holding a Ph. D. Additionally, 86.1% of all people within the institution who are members of the *Sistema Nacional de Investigadores* (SNI), the most important peer review system of Mexican researchers, are employed at these three campuses. Other important research-related resources are also concentrated in these campuses. To exemplify, endowed chairs are highly concentrated in the same campuses and have proven to be an effective mechanism in the pursuit of research within the institution. In fact, Cantú, Cruz, and Ramos (2005) report that 87% of the 53 endowed chairs granted by the institution in 2004 were operating either in Monterrey, Estado de Mexico, or Ciudad de Mexico campuses. On the other hand, Cantú et al. also highlight that 66 of the 72 master's and 8 of the 9 doctoral programs being offered by the institution in 2004 under the face-to-face modality, operated at those same campuses. Student enrollment in these programs accounted for 88% of the institution's entire student population under this modality. Here, it is noteworthy to underscore that the existence of face-to-face graduate

programs has been traditionally reported by many scholars as decisive when conducting research. To complete the picture, 209 of the 311 professors pursuing doctoral studies in 2005 were also linked to the cited campuses. This fact gains increased relevance when considering that pressure within universities towards conducting research usually develops from faculty members holding a Ph.D. From all of the above, it is very likely that these three campuses will achieve the research goal, which is why this study did not consider them as part of the sample. Indeed, statements made by many interviewees pointed to the prominent role that Monterrey, Estado de Mexico, and Ciudad de Mexico campuses are playing in the fulfillment of the research strategy. Additionally, the vast research related resources of these campuses further validated the decision to exclude them from the study's sample.

With the three largest campuses discarded as sub-sites, the next campus in line for consideration was Guadalajara. As the fourth largest campus, its status as research oriented along with a relative scarcity of research related resources deemed it to be a suitable campus for this study. Nonetheless, I concluded that my position in relation to the Guadalajara campus would greatly compromise the validity of any data gathered. More specifically, I am a former president of the campus. That fact may have been advantageous regarding access to people and information as well as personal firsthand knowledge of the campus, all considered as valuable for the purpose of this study, but it may also have encouraged interviewees or information gatekeepers to compromise the value of data, withhold information, or slant information towards what they want the researcher to hear or towards what they believe the researcher wants to hear (Creswell,

1998). Therefore, after pondering the implications just listed, I concluded that the drawbacks far outweighed the benefits and the Guadalajara campus should not be considered for the study.

Querétaro campus was the first among the research-oriented group that met the criteria for consideration as a sample for this research project. It is briefly introduced next.

Querétaro campus. Although it is the Tecnológico de Monterrey's fifth largest campus, based on the 3,570 undergraduate and graduate students it served during the fall semester 2005, Querétaro is considered a medium-sized campus within the institution. It is also a research oriented campus, though it lags far behind the three largest ones in terms of access to critical research related resources. This condition translates into uncertainty about whether or not this campus will achieve the research goal and, consequently, made it an excellent sub-site for the purposes of this research project.

Founded in 1975, the Querétaro campus offers 17 undergraduate majors and 3 face-to-face master's programs in addition to those associated with the Virtual University. It has two academic divisions: the Division of Administration and Social Sciences (DACS) with 1,428 students and the Division of Engineering and Architecture (DIA), with 2,142 students. The undergraduate majors offered by the DACS are: Business Administration, International Business, Marketing, Accounting and Public Finance, International Relations, Communication Sciences, and Organizational Psychology. The DACS programs also include an MBA. The DIA offers undergraduate majors in Architecture, Industrial Design, Agriculture Engineering, Food Industry Engineering, Industrial and

Systems Engineering, Mechanical Engineering Management, Mechatronics Engineering, Computer Technologies Engineering, Electronic Technologies Engineering, and Information and Communication Technologies Engineering. The DIA also offers two master's programs, one in Architecture and New Urbanism and the other in Manufacturing Systems. The campus faculty is comprised of 85 full-time and 279 part-time professors. Moreover, only one of the full-time professors has SNI membership and 29 hold a Ph.D.

The campus is located in the city of Querétaro which has a population of 734,000 (INEGI, 2005). The city is in the country's heartland and only a two hour drive from Mexico City. The campus is part of the institution's Central Zone, which includes the Estado de Mexico and Toluca, also research-oriented and the third and sixth largest campuses, respectively. In fact, the three campuses are geographically located very near to each other in a highly populated area with high volume of industrial and commercial activity. Taking advantage of this situation, the city of Querétaro has developed the infrastructure to host vast numbers of plants associated with the manufacturing and the food industries. Its reputation and location are so convenient that 37 public and private research centers were attracted to establish operations there.

León Campus. León is a smaller campus with a fall semester 2005 student population of 1,128 undergraduate and graduate students. It is part of the institution's West Zone which comprises eight campuses. Guadalajara is both its flagship and the only research oriented campus. Although the León campus has been categorized as non-research oriented, it is aspiring to become research oriented like a few other campuses. This

aspiration and the disadvantages associated with having a small student population and being classified as a non-research oriented campus resulted in its inclusion as a sub-site for this research project.

The León campus was inaugurated in 1978 and today offers eight undergraduate majors. As a result of not having face-to-face graduate programs, all of the León campus graduate students are enrolled at academic programs broadcast by the institution's Virtual University. The campus has three academic divisions: the Division of Business and Humanities (DPNH), the Division of Engineering and Sciences (DPIC), and the Division of Graduate and Continuing Education (DPEC). During the fall semester 2005, the DPNH enrolled 615 undergraduate students majoring in Business Administration, Finance Administration, International Business, Marketing, and Accounting and Public Finance. The DPIC served 364 undergraduate students majoring in Industrial and Systems Engineering, Mechatronics Engineering, and Computer Technologies Engineering. The campus' 149 graduate students were enrolled at the DPEC. The campus faculty is comprised of 21 full-time and 101 part-time professors. Moreover, none of the full-time professors have the SNI membership and nine hold a Ph.D.

According to the INEGI (2005), León city has a population of 1.3 million. Interestingly enough, it is only 105 miles west of Querétaro city. Moreover, both cities are part of a well identified industrial, agricultural, and horticultural corridor. León has developed a worldwide reputation for the quality of its leather goods and exports high volumes of shoes which forms the principal engine of its ongoing growth. Nevertheless, it is noteworthy to mention that many higher education institutions considered to be

direct competitors of the León campus also operate in the locality. Indeed, that fact has often been utilized to explain why a city much larger than Querétaro hosts a campus that is one-third the size of the Querétaro campus. It is fair to say that the city size, its large number of higher education institutions, and its industrial and economic activity all account for the existence of a large number of research centers in León and its surroundings.

Sample population

Sampling in order to maximize range and variation was the approach to selecting respondents for this research project. Under this method, respondents are purposively selected in order to capture different perspectives related to the problem being studied (Weiss, 1994). A total of 39 people were selected to be interviewed. Three top academic administrators were drawn from the institution's system level. The rest of the sample was drawn from each of the two campuses. This sub-set included academic deans, academic department heads, academic program heads, deans of other units, and administrators, including the campus presidents. Their status as decision makers, the leadership role they play within their units, and the knowledge they have regarding not only their unit but other units and their knowledge of the institution as a whole determined the inclusion of all the categories of people mentioned above as part of the sample population. Finally, the perspectives of those having the last word regarding research were not excluded. Therefore, full-time professors from each of the two campuses were also part of the sample. Table 3 contains detailed information about the people interviewed at the two campuses. In this respect, it is important to underscore that although many interviewees

at the León campus held more than one position simultaneously, they were linked with just one of them. This explains the absence of department heads reported as interviewees. In fact, the academic deans have been playing the additional role of department head since 2006.

Table 3

Profile of interviewees drawn from Querétaro and León campuses

| Position's title | Querétaro | | | León | | | |
|------------------|-------------------|-----|-------------|-------------------|------|------|-------------|
| | Academic division | | Other units | Academic division | | | Other units |
| | DACS | DIA | | DPNH | DPIC | DPEC | |
| Dean | 1 | 1 | 1 | 1 | 1 | 1 | |
| Department head | 2 | 4 | | | | | |
| Program head | 2 | 1 | | 3 | | | |
| Administrator | | 1 | 2 | | 4 | | 3 |
| Professor | 2 | 2 | | 2 | 2 | | |
| TOTAL | 7 | 9 | 3 | 6 | 7 | 1 | 3 |

Note. DACS = Division of Administration and Social Sciences; DIA = Division of Engineering and Architecture; DPNH = Division of Business and Humanities; DPIC = Division of Engineering and Sciences; DPEC = Division of Graduate and Continuing Education.

It is noteworthy to mention that 23 of the 39 interviewees had a Ph.D. as their highest academic degree. The rest held a master's degree. The fact was judged as relevant to the purposes of this study given that, for the most part, doctoral studies are considered research training programs. Therefore, it could be said that people holding a Ph.D. are

more knowledgeable about research requirements. Table 4 details the places where interviewees earned their graduate degrees other than the Tecnológico de Monterrey. It is noteworthy to mention that position and academic division were the criteria utilized to select the people to interview rather than place where graduate studies were pursued.

Table 4

Places where interviewees pursued their graduate studies

| Location | Master's | | | Ph.D. | | |
|---------------|----------|-----------|------|--------|-----------|------|
| | System | Querétaro | León | System | Querétaro | León |
| Mexico | | | 3 | | 4 | |
| United States | 1 | 1 | 2 | 2 | 4 | 4 |
| Canada | | | | | 1 | |
| Europe | | | 1 | | 6 | 2 |

It has been argued that institutional inbreeding may prevent a university from improving. Hence, under the premise that outsiders bring in new and many times better ideas, universities are advised to keep inbreeding at low levels. In this respect and as demonstrated in Table 4, graduate studies outside the Tecnológico de Monterrey were pursued by 31 of the 39 people sampled for this research project. In fact, 24 of these people graduated from universities outside Mexico. Interestingly enough, 15 of the 19 interviewees from Querétaro campus held a Ph.D. Indeed, all of its full-time professors

were Ph.D.'s. That was not the case for León campus where only one of its professors holds a Ph.D.

Researcher's positionality

In addition to the bias that every researcher introduces into the qualitative research process, my position may also affect the validity of this study because of my links to the institution under study. Indeed, I have been employed by the institution for 19 years, although never in the campus locations sampled for this study.

Studying the researcher's own organization could be disadvantageous in several ways: 1) people within the organization being studied (i.e. interviewees and information gatekeepers) may either compromise the value of data, withhold information, slant information towards what they want the researcher to hear or towards what they believe the researcher wants to hear, or provide information the researcher should not or would not ordinarily have access to (Creswell, 1998). On the other hand, it is almost certain that access to both people and documents necessary to conduct this study would not be granted to anyone who is not part of the institution in question. In addition, an insider best understands the complexity of a system (Wolcott, 1987). Therefore, the researcher's knowledge of the organization becomes an asset for the success of the study. Moreover, Miles & Huberman (1994) point out that a researcher's familiarity with the phenomenon and the setting under study positively influence the quality of qualitative research. Consequently, despite the above mentioned drawbacks associated with the researcher's positionality, his privileged position regarding the institution made conducting this study worthwhile.

Data collection

The interviewing process grants researchers access to people's perceptions as well as to their interpretations of these perceptions. Weiss (1994) assures that qualitative interviews sacrifice uniformity of questioning yet achieve more information from interviewees. Studies based on this type of interviews capture multiple perspectives on phenomena that could not be reached by other means. Semi-structured interviews containing open-ended questions are often associated with qualitative studies and with case study as one of its strategies of inquiry (Creswell, 2003). The term 'semi-structured' refers to interview questions standardized to a certain degree while allowing some openness for response from interviewees at the same time. Moreover, regardless of how structured they could be, structured interviews are also seen as appropriate for testing theories already built (Wengraf, 2001), which is the case in this study. Hence, semi-structured interviews containing open-ended questions constituted one of the two data gathering methods for this case study.

The interview questions were developed based on both the research questions and the theoretical framework chosen for this study. The interviews were conducted face-to-face and one-on-one by the researcher in April 2006 at León, Querétaro, and Monterrey, in that order. The average interview lasted 56 minutes, the shortest ranging from 35 and the longest to 90 minutes. In order to fully capture the richness of their answers, no time limits were set on the interview period. In addition, to reduce interviewer bias, my interventions were limited to introducing the questions and to keeping the interview

flowing. I conducted the interviews in Spanish and transcribed them. Indeed, transcriptions accounted for approximately 500 single-space typed pages.

All data collection methods have bias embedded. Interviews, which are considered as an obtrusive method of data gathering, are not the exception. As previously mentioned, the interviewee's answers could be influenced by the interview process itself (Whitt, 2001). Across-method triangulation aims to overcome the weaknesses of one data collection method with the strengths of another (Denzin, 2001). As a way of avoiding the same source of invalidity introduced by obtrusive methods, the use of unobtrusive methods of gathering data, for example, is highly recommended. These methods reduce invalidity because they do not react with the respondents, the researcher, or the research design (Stage & Manning, 2003). Derived from all these considerations, document analysis was considered as an additional method of data gathering in combination with the semi-structured interviews.

The documents analyzed were primarily text-based and were not generated for this study. Moreover, even though text data represents a higher quality form over non-text-based forms of data (Mason, 1996), it did not prevent me from scrutinizing documents prior to their inclusion in order to validate the study's theoretical framework. The documents analyzed were mostly institutional and can be classified in three different categories: 1) printed public documents such as mission statements, brochures, research and other periodical reports, and books; 2) audiovisual documents such as DVDs produced as a testimony of the annual meeting of the institution's trustees and addresses by the institution's president broadcast through its Virtual University; and 3) electronic

public documents such as commercial newspapers, institutional newsletters, and the weekly newspaper edited by the institution's Monterrey campus. In this respect, despite of its association with the Monterrey campus, the newspaper is used by the institution's system as an official medium of communication. Indeed, four of the five members of the newspaper editorial board report to others at the system level (personal communication, February 14, 2007). Furthermore, information gathered from the official website of the institution as a whole as well as from those of its Monterrey, Estado de Mexico, Ciudad de Mexico, Querétaro, and León campuses was also utilized for triangulation purposes.

Ethical considerations

Through conducting research in an ethical manner, researchers assume responsibility to protect a study's participants. To illustrate, specifically requesting consent to document access and protecting people's identity keep research on solid ethical grounds (Lancy, 1992; Mason, 1996; Marshall & Rossman, 1999). Accordingly, the fieldwork for this study complied with all requirements from the University of Arizona Human Subjects Committee. Specifically, all people sampled were first contacted via the institution; they provided in advance with a Disclaimer Consent Form written in both Spanish and English, including information about the purpose of the study, selection criteria, risks and benefits, as well as the voluntary nature of participation, and maintenance of anonymity. No one person refused to participate in the study.

The voluntary aspect of participation was made clear again in person at the beginning of each interview when redescribing the project. Moreover, it was stressed that it was possible to discontinue participation in the project at any point for any reason. In

addition, participants were reminded that the study was intended only for academic purposes and that their identities would not be discernable from the study's findings.

As a way of respecting and protecting the research participant's privacy during the interview, the participants were informed that they had the freedom to choose the interview location, whether on or off their respective campus. Nevertheless, all participants agreed to be interviewed at the campus where they were employed. Derived from this, a site authorization from each of the campuses was requested and granted.

Securing the data is another important ethical issue when conducting research (Berg, 2004). Thus, this researcher has taken sufficient precautions to prevent misuse of information gathered for this study.

Data analysis

Following Marshall & Rossman's (1999) advice, this study's research questions and theoretical framework guided the data analysis. Hence, academic capitalism, institutional theory, and Hackman's theory of resource allocation were the points of reference when assigning meaning to the collected data. Through data analysis, gathered information is organized and presented with a narrative explaining the studied phenomenon in terms of the theories relevant to the study in question (Rubin & Rubin, 1995).

Although in its early stages, coding implies analysis. Through coding, the researcher translates empirical data to the theoretical level (Conrad, 2001). Coding is perhaps the most time consuming phase of a qualitative study. Nonetheless, it is undoubtedly vital for the study's findings. Analysis of data collected for this study relied heavily on coding, which refers to categorizing all the information gathered through the interviews and the

documents in order to give them meaning. A provisional ‘start list’ of codes prior to fieldwork can be established as part of the coding process and based on the study’s conceptual framework, research questions, and key concepts (Miles & Huberman, 1994). Consequently, a ‘start list’ of codes was developed that included the theoretical framework key concepts and enriched throughout the analysis process until it evolved into the list demonstrated in Table 5.

Table 5

Codes used during data analysis

| CODE NAME | CODE NAME |
|---|---|
| <ul style="list-style-type: none"> ▪ Market-like behaviors ▪ Knowledge-based economy ▪ Competitiveness ▪ University-industry partnerships ▪ Applied research ▪ Basic research ▪ Research strategy ▪ Focus of research ▪ Agreement with research strategy ▪ Disagreement with research strategy ▪ Knowledge transfer ▪ Technology transfer ▪ Research networks ▪ Technology parks ▪ Business incubators ▪ National development | <ul style="list-style-type: none"> ▪ Patents ▪ Interstitial organizations ▪ Self-sufficiency ▪ Research facilitators ▪ Research inhibitors ▪ Isomorphism ▪ Legitimacy ▪ Prestige ▪ Competition ▪ Efficiency ▪ Central units ▪ Peripheral units ▪ Dependence ▪ Critical resources ▪ Power ▪ Stratification |

All interviews were conducted in Spanish, transcribed, and translated into English by me to the computer for the purpose of later coding. The data collected from the document analysis were also subjected to the coding process.

Limitations

Either because of the complexity of the phenomenon under study or because of the specific environment surrounding the Mexican higher education system and/or the particular institution studied, the theoretical framework chosen for this research project may not fully address the declared goals. Therefore, this situation could be considered as a limitation attached to this research project.

Another limitation for case studies arises from both the absence of statistical techniques and populations ‘poorly’ represented in qualitative case studies which are often invoked as drawbacks that prevent these studies from being considered good sources of generalization. These limitations appear even greater regarding single case studies. Nevertheless, when range of generalization rather than generalization is addressed, the alleged limitation may not exist. Accordingly, a case study’s range of generalization could be considered a matter of judgment by those who wish to apply the findings that resulted from case studies as the best judges rather than the researchers themselves (Kennedy, 1979). Properly described, case studies help readers to establish the basis for their generalization (Stake, 1978).

Based on these considerations and on the fact that this study was conducted under the case study format, the range of generalization for the results has to be decided by those

wishing to apply the findings. Hence, lack of generalizability as a limitation for this study will vary. Even if confronted by a null generalization, this study could at least become a reference point for further research on the same topic.

Conclusions

A quantitative approach was considered as the most appropriate for the purpose of this research project. Additionally, case study was the selected strategy for the referred approach. The characteristics of the sampled respondents allowed me to capture different perspectives relevant to the research questions formulated for this study. The information collected through the interviews and its later analysis constituted the primary reference point to test the study's theoretical framework. The potential for bias introduced into the study's findings through the interview process was at least reduced by including information contained in documents which were also analyzed.

Key concepts at the core of the study's theoretical framework guided data analysis. Additional concepts that emerged from the empirical data were also incorporated into the process. Finally, the unique characteristics of the institution selected for conducting this research project were of great significance to the understanding of the phenomenon under study.

CHAPTER IV: FINDINGS AT THE SYSTEM LEVEL

Introduction

For over a century, research has been a major activity in many universities. Indeed, it has been argued that universities have become the principal home of science (Wolfe, 1972). Through research, universities have advanced knowledge and led society to progress as a result. Prestige and legitimation are what universities have gained in return. Despite all of these outcomes, many universities have either not decided or not been able to engage in research as a central part of their mission.

The prominent role that knowledge creation currently has worldwide, is leading those universities not having research among their main activities to reconsider their mission. Accordingly, the number of universities including research as part of their mission is increasing. The Tecnológico de Monterrey is an example of this phenomenon. Based on the findings from in-depth interviews and document analysis, this chapter presents the institution's rationales behind this shift and the strategies that have developed from them. Some of the implications associated with the reorientation are addressed.

The information in this chapter was gathered from two sources: 1) interviews with policy and decision makers occupying high positions at the institution's system level, and 2) the various resource documents utilized in this study. The chapter is intended to provide a broad picture regarding the institution's rationales behind its research commitment, the strategies designed for this purpose, and how these strategies are being implemented.

The institution's role in Mexico's development

Since 1985, Tecnológico de Monterrey reviews its mission every 10 years. On its 2005 mission statement, released in 1996, an explicit institutional commitment to Mexico's development was included for the first time. Specifically, the mission stated that it intended to help Mexico face challenges such as the creation of more jobs, international competitiveness, democratization, and the improvement of education (Tecnológico de Monterrey, 1996).

Through the years, the referred commitment has become even stronger and more explicit. On the institution's web site, the president states that with the 2015 mission "the institution takes a step forward in its commitment to Mexico: to play a more active and dynamic role in generating greater well-being in the country's communities."

The intended role now translates into very specific goals within the mission statement. Along the mission's life span, the institution aims to:

- Promote the international competitiveness of business enterprises based on knowledge, innovation, technological development, and sustainable development.
- Develop business management models to compete in a global economy.
- Create, implement and transfer business incubator models and networks in order to contribute to the creation of enterprises.
- Collaborate in professionalizing public administration and analyze and propose public policies for Mexico's development.
- Contribute to the sustainable development of the community with innovative models and systems for its educational, social, economic and political improvement.

The Tecnológico de Monterrey president's vision is of universities acting as an engine of a countries' development; this vision encompasses all the above goals. He asserts that universities must push societies towards a new development stage rather than acting only as sources of trained human resources ("Deben ser," 2005).

As a way of legitimization, the paradigm about the role that universities must play nowadays has been presented to the many stakeholders of the institution. To exemplify, on February 20, 2006, while addressing the Tecnológico de Monterrey Board of Trustees, the institution's president stated that the institution must become the engine of Mexico's development, arguing that otherwise the leadership role could not necessarily be assumed by someone else (Rangel, 2006). Targeting the same audience on the same date, Michael Crow, Arizona State University president, reinforced the message by acknowledging that the role universities play in the communities' development has become of critical importance. He also admitted being thrilled by knowing that Tecnológico de Monterrey is heading toward the same direction as the university over which he presides ("Son universidades," 2005).

Competitiveness. Giving the goals listed on its mission, it is clear that helping Mexico to develop translates into very specific things to accomplish by the institution. Increasing the country's competitiveness is among them and is seen critical for success. Tecnológico de Monterrey's president is convinced that Mexico needs to change its unskilled labor based strategy in order to regain competitiveness. He envisions innovation and technology development as targets the country should focus on for the next ten years. Under his approach, Mexico must create technology-based business incubators and

technology parks, organize industrial clusters, and promote a culture based on knowledge across the nation. Failing to include universities as the mechanism for the implementation of the approach would prevent it from succeeding. Furthermore, he calls universities to change their mentality and become promoters of society's development (Rangel, 2005).

The knowledge economy. There are no doubts that Tecnológico de Monterrey has a strong conviction that the knowledge economy is beneficial and therefore must be pursued. To illustrate, the institution's 2015 vision statement asserts that in the year 2015 the institution will be widely recognized "...for the research and technological development it carries to promote a knowledge-based economy..." (Tecnológico de Monterrey, 2005b, p. 7). Actually, the 2005 edition of the institution's internal conference on research and technology development focused entirely on the knowledge-based economy. A total of 512 academic works were presented then ("Publicaciones recibien," 2005).

Through different interlocutors, Tecnológico de Monterrey is also urging the Mexican community to admit that the knowledge economy phenomenon has changed the bases for competitiveness. Robles, Molina, and Fuentes (2005) argue that in the future the abundance of unskilled labor will not longer be a competitive advantage for a country's economy. On the contrary, it will become a disadvantage in a knowledge-based economy context translating into less competitiveness and lower income levels for its population (p.16). Furthermore, based on the World Bank's Knowledge Assessment Methodology (KAM), they created an index to assess the level of competitiveness across Mexican states.

In accordance with KAM, the index praises those states having economic and institutional structures favoring entrepreneurship, educated and skilled population, an innovation system capable of developing new technology as well as of taking advantage of the global knowledge stock, and advanced Information and Communication Technologies (ICT) in place.

The rationale for research

If commitment to Mexico's development is at the core of Tecnológico de Monterrey's mission, research is considered one of the primary mechanisms for its fulfillment. In this regard, the president of the institution's board of trustees has declared that "in the twenty-first century the institution will not be focused only on teaching but on knowledge creation and its transfer to society in different ways" ("El Reto," 2005). By the same token, Tecnológico de Monterrey's president stresses that the institution will contribute to Mexico's development by conducting research in strategic fields ("Plantean nuevos," 2006). Moreover, he asserts that research must transform the institution into the engine of Mexico's development (Rangel, 2006).

Although research now permeates many aspects of Tecnológico de Monterrey, it only began to be intentionally pursued in 1985. The institution's mission released in that year (the first of its current president's tenure) assign research the role of strengthening the Tecnológico de Monterrey's graduate programs (Elizondo, 2003). For a top administrator who has been working at the institution for the last forty years, "the idea of transforming the institution from being a teaching university to becoming a teaching and research university began to be declared in 1985 with the new mission". He also adds that the

institution's renewed interest in conducting research observed in its 2015 mission clearly reflects the third phase of the Tecnológico de Monterrey president's tenure. He associates each phase to each of the three missions released in the last twenty years.

The association between tenure phases and missions is also shared by another top administrator at the institution's system level. She describes research at the institution not as a sudden interest but as a planned, phased, evolving process, and more specifically, points to the establishment of a graduate and research division at its Monterrey campus in 1985 as the symbol of the first of the three-stage process. For her, during the 10 year time period that this stage lasted, Tecnológico de Monterrey also engaged in developing human resources capable of conducting research. During the second stage of the process, the institution made a deeper commitment to research. The focus then was on acquiring the equipment and providing the physical spaces that research demands to take place. Finally, in 2005, the institution's 2015 mission inaugurated the third stage of the process. At this stage, allocation of internal financial resources to research and changes to professors' workload along with other changes will presumptively allow Tecnológico de Monterrey to conduct research systematically.

The research strategy

In order to fulfill the goals of its mission, Tecnológico de Monterrey created 10 strategies. From them, six could be associated either directly or indirectly with the research approach adopted by the institution. They are the following:

- Promote and direct investigation and graduate programs towards the achievement of the Mission.

- Develop models and create networks of business incubators; and, create centers for management and technology transfer to promote competitiveness.
- Internationally position the Graduate School of Administration and Leadership.
- Develop the Graduate School of Public Administration and Public Policy.
- Establish centers for the transfer of knowledge for sustainable social development.
- Strengthen the presence and prestige of Tecnológico de Monterrey in Mexico and Latin America and promote the growth of the Virtual University and TecMilenio University.

Knowledge transfer. Along with research, knowledge transfer is considered as another pillar of Tecnológico de Monterrey's research strategy. In the preface of Esquivel's (2005) book *La investigación del Tecnológico de Monterrey para la competitividad y el bienestar social*, the institution's president underlines its importance by stating that the institution's faculty research efforts "must be directed at promoting development through the creation and transfer of knowledge". According to the vice-president for research and development, "knowledge transfer will help knowledge economy to detonate" ("Promoverán transferencia," 2005). For the president of the institution's board of trustees, "transfer of knowledge to the private and public sectors as well as to the entire society" is one of the main objectives of Tecnológico de Monterrey's mission ("Mayor exigencia," 2006). It is also noteworthy that knowledge transfer is expected to meet a specific requirement. The institution's president has officially stated

that “a measurable impact must result from all that we [the institution] transfer” (Rangel, 2006).

Continuing education is considered within the institution as a primary vehicle for the transference of knowledge. Actually, people responsible for continuing education across the institution have been called upon to design a comprehensive plan that addresses the issue in an effective way (“Analizan educación,” 2006). Indeed, some steps have been taken in that direction. Specifically, the institution just agreed with New Jersey-based multi-national Johnson & Johnson to become its training center for physicians regarding nanotechnology. The contract is part of a broader agreement targeting cardiology-related projects. By the same token, agreements targeting nuclear medicine and pediatrics have been reached with multinationals Siemens and Wyeth Pharmaceuticals respectively. Finally, Fortune 500 biotechnology company Amgen has announced that Tecnológico de Monterrey will coordinate its 10 research centers operating in Mexico (González, 2006).

Type of research. The institution has also taken a stand on the orientation of the conducted research. Because of its allegedly faster and greater impact on Mexico’s development, applied rather than basic research has been chosen as the primary type of research to be pursued at the institution. Its president states that in order to help Mexico to remain competitive Tecnológico de Monterrey must not “conduct only theoretical research or limit research to publishing, but conduct more practical research that creates development in the milieu” (“Deben ser,” 2005). Lack of resources is also mentioned as keeping the institution from engaging in basic research. Instead, a top administrator voices that “we [the institution] want to do technology development from discoveries

already made on the U.S. or Europe....It represents an enormous niche”. It is worth mentioning that many of the interviewees and documents on which this research is based equate technology development with applied research.

Self-sufficiency. In addition to the research orientation, the institution requires research to be sponsored and self-sufficient since 1985 (Elizondo, 2003). “This policy was set not only because of the lack of institutional resources for research but also to assure that research would help Mexico develop through the increased competitiveness” (Esquivel, 2005). In order to meet these criteria, researchers usually need to buy their own equipment if the project they are working on requires it. Furthermore, research is nowadays addressed by the institution from a business perspective. To exemplify, its president recently declared that Tecnológico de Monterrey “must enter into the research business; it is where opportunities are....We should get research contracts” (Rangel, 2006).

This economic approach allegedly makes research viable for the institution. In words of a top administrator, the approach intent is that “the outcomes of research not only solve a specific problem but also provide the institution with enough financial resources to funding future research.” In accordance with the referred approach, the institution allocated 110 million dollars to the establishment of a medical research center at its Monterrey campus in early 2006. Projects undertaken by this center are expected to be self-sufficient (“Crean nuevo,” 2006). Additionally, the director of the biotechnology research center has declared that “we [the center] want to conduct relevant, sustainable,

and self-sufficient research. Clearly, we can not afford to be an academic center; we must be linked with the outside world” (“Hacia una,” 2005).

This policy requiring research to be sponsored and self-sufficient, along with the statements made by the institution’s president presented thus far, provide us with a good picture of his concept regarding the role that his institution should play in order to successfully introduce Mexico into the knowledge economy. Recapitulating, he visualizes the Tecnológico de Monterrey acting through knowledge creation and its transference as an engine that will bring the country into competition with knowledge-based economies. The establishment of technology-based business incubators and technology parks are conceived as enablers of the transformation process. The approach also demands applied research with measurable impact as well as self-sufficiency and profitability. Unsurprisingly, acting in his capacity as the institution’s leader, he is actively engaging the institution to play the intended role.

According to the theory of academic capitalism (Slaughter & Rhoades, 2004), the particular approach that he is following transforms him into an administrative academic capitalist. The theory identifies several forms in which universities’ administrators transform into academic capitalists. Nonetheless, despite the form, a characteristic they all have in common is the pursuit of market opportunities; they drive universities to create and take advantage of commercial opportunities. Administrative academic capitalists approach the knowledge economy in ways that secure revenue streams for their institutions.

Another salient characteristic of the administrative academic capitalists is the impact of their decisions upon the whole organization. Consequently, the president's concept of research as a business coupled with his strategy to take advantage of it clearly exemplifies what an administrative academic capitalist does. Of course, the same applies for all the Tecnológico de Monterrey's administrators approaching research within the institution in the same way. Examples of some of the outcomes associated with the implementation of the referred approach are presented next.

In compliance with both the applied research and the self-sufficiency paradigms, the institution has been seeking funds from external sources and experiencing positive results. With the financial sponsorship of Johnson Controls, Inc., a laboratory to conduct research on advanced materials for car batteries was inaugurated on September 2005 at the institution's Monterrey campus ("Apoyan investigación," 2005). The sponsor is a multinational supplier of the automaker industry with annual income sales of above 27 billion dollars. One month later, the same campus also received financial resources from Alcoa Foundation to conduct research on sustainable development ("Trabajaran en," 2005). Alcoa Foundation was created by Alcoa, the world's leading producer of aluminum. On the other hand, joint research on journalism recently started under an agreement between the institution's Estado de Mexico campus and the Ealy Ortiz Foundation. The foundation is part of El Universal, a national Mexican newspaper ("Impulsarán investigación," 2005).

Focus of research. Focusing research on certain areas is also part of the institutional strategy regarding research. In the words of its president, "the goal is to take the

Tecnológico de Monterrey to succeed in becoming the engine of the country's development through conducting research on strategic sectors". Specifically, on February 20, 2006, while addressing the Tecnológico de Monterrey Board of Trustees, he mentioned biotechnology, health sciences, mechatronics design, information and communication technologies (ICT), software development, and the development of innovative education systems using technology as the strategic areas of focus for the institution. Nonetheless, Cantú et al. (2005) as well as the institution's website (updated May 31, 2006) list a different set of strategic areas for research. To specify, neither health sciences nor mechatronics design are included while other areas such as materials; design and manufacturing processes; infrastructure and urban and rural development; management and public policy; management and business direction; incubation of technology-based business; innovation technology parks; and humanities were added. Moreover, industries such as automotive, electronic, software, pharmaceutical, aeronautical, and the food industry are also presented on the referred website as of interest for the institution "due to the role they play for the development of the regions in which the Tecnológico de Monterrey has campuses". On the other hand, Cantú et al., as well as the institution's website, make clear that five of the areas for research focus are aligned with those stated by the Mexican National Council of Science and Technology (CONACYT) in its Special Program for Science and Technology 2001-2006 as strategic for the country. These areas are ICT; biotechnology; materials; infrastructure and urban and rural development; and, design and manufacturing processes. It is believed within the institution that greater governmental funding for research at least on these areas will

result from the alignment. In this respect, it is important to mention that CONACYT is the governmental agency responsible for the design of Mexican science and technology policies. According to the agency's website, these policies must contribute to the rise of living standards and well-being of the Mexican population as well as to the enhancement of business quality, competitiveness, and innovation.

Recapitulating, while some areas of research interest for the Tecnológico de Monterrey are included in all the referred lists, inconsistencies are evident. The fact is of high relevance because it could mislead, confuse, and/or discourage those within the institution linked to the research strategy and may even compromise its accomplishment.

The vice-presidency for research and development (VID). Aiming to coordinate the design and implementation of the institutional efforts regarding its research strategy, the VID was created in early 2005. It is organized around three sectors: private, public, and social. Business incubators, technology parks, knowledge networks, technology transfer, continuing education, endowed chairs, the Graduate School of Administration, and the Graduate School of Public Administration and Public Policy are among the most important projects conceived to succeed in this endeavor. On the other hand, several mechanisms have also been created to help professors with academic writing and the publishing process. Specifically, on September 12, 2005, the institution launched its editorial program, which provides revision and feedback on professors' writings. Help with writing scheduling and even legal advising is also offered ("Apoyarán la," 2005). Moreover, agreements with publishers have been developed so as to ease the publishing process ("Distribuirán conocimiento," 2006).

The goals set for the VID leave no doubts that it exemplifies an organization whose primary purpose is to link the Tecnológico de Monterrey to the new economy in ways that secure revenue streams for it. According to the theory of academic capitalism, the VID along with organizations like the technology transfer office that might stem from it allow universities and colleges to shift from a public good knowledge regime to an academic capitalist regime (Slaughter & Rhoades, 2004).

Finally, preexisting mechanisms like the three research awards that Tecnológico de Monterrey instituted prior to 1995 aiming to both recognize and encourage research and publishing activities within its academic community have regained importance within the context of the current research strategy. Over time, the associated economic prizes have become more significant and the awards more prestigious among the Mexican academic community.

Endowed chairs. As previously noted, conducting research was not explicitly considered part of the Tecnológico de Monterrey's mission since its founding in 1943 and for the next 40 years. Of course, this does not imply that the institution was not conducting research during that period of time. Actually, in several of the institution's printed research reports, it is noticeable that some of the research projects even received grants from international agencies and corporations like the World Bank, the United Nations, The National Science Foundation, the Rockefeller Foundation, the Commission of the European Communities, AT&T, Motorola, and Bell Northern, among others. Of course, Mexican agencies and corporations also sponsored research. Nonetheless, perhaps due to the absence of a strategy favoring research along with no internal allocations of

financial resources to it, research projects were always limited in number and sporadic. Moreover, despite the fact that the institution has embraced research as part of its mission since 1985, neither significant nor systematic research activity has been observed for almost the last 20 years. Referring to this, a top administrator expressed that “in 2002 the institution concluded that it did a poor job in fulfilling its research public commitment....At that time, only 6 of the 70 graduate programs that the institution had were listed as excellent by CONACYT”. Relevant research activity is a primary criterion used by this governmental agency for awarding the excellence distinction to graduate programs. A former dean of the Monterrey Campus Graduate and Research Division also coincides with the assessment by saying that:

For many years the institution did not put money where its mouth was. It was hard for us to recognize that research demands financial resources from the institution, especially regarding long term projects. Industry usually funds short term projects. However, many of those projects are consultancy rather than research projects.

The discouraging performance regarding research and the conviction that institutional funding could make a difference led the institution to the establishment of endowed chairs on January 2003. The vast majority of research performed through endowed chairs is focused on areas considered strategic to the institution. In addition, they are seen as reflecting “the institution’s long term commitment to research”. According to the institution’s vice-president for research, endowed chairs “promote competitiveness of business enterprises, the development of the knowledge economy, and contribute to society’s sustainable development” (“Investigación: Núcleo,” 2005). An endowed chair is constituted by 4 to 6 professors and about 10 graduate and undergraduate students. It receives institutional funds at a rate of \$150,000 per year

during its first five years of operation. These funds are suppose to be spent on salaries for professors replacing the teaching of those now involved in the chair, student scholarships and stipends, research-related equipment if any, and other operational expenses.

However, it is expected that by the fifth year of its operation the chair must be able to attract external resources at a rate of \$300,000 per year (Esquivel, 2005). This requirement derives from the institution's self-sufficiency criterion attached to research. Additionally, evaluation criteria for chair performance was divided into four issues: publishing, academic, and research credentials of their human resources; membership of those human resources to prestigious research networks, particularly to the *Sistema Nacional de Investigadores* (SNI), the most renowned network of Mexican researchers, as well as awards granted to them; a capacity for attracting financial resources from outside the institution; and, other additional factors.

All people interviewed at the system level agreed that the endowed chairs have been very successful. Referring to the perspective that research at the institution can be seen as a planned, phased, evolving process, one of them explained that the institution is now succeeding in conducting research "as a result of having gone through the two previous phases of the process". Moreover, additional benefits have been associated with the chairs. One interviewee stated that:

Contrary to what happens when research is funded by external sources, the chairs have provided the institution with more freedom in selecting the research niches to focus on. External funding was taking the institution to work on areas not aligned to its best interests.

According to Cantú et al. (2005), each of the 53 endowed chairs established by the institution in 2004 was linked not only to one of the strategic areas chosen for research on

which to focus but to one of the institution's 33 campuses as well. Based on their report, it is noticeable that research conducted through the endowed chairs is concentrated in very few campuses. In fact, half of the endowed chairs operate at the Monterrey campus. When considering the next two largest campuses, the figure raises to 87%. On the other hand, during the 2004-2005 academic year, these three campuses enrolled 42% of the institution's student body and employed 56% of its faculty holding a Ph. D. Furthermore, of all the researchers within the institution who are members of SNI, 86% were employed at these campuses. Therefore, the interviewee's statement that "Monterrey campus has impressive results because of its sufficiently trained people to conduct research", is hardly surprising.

A different yet not less important reason why only a few campuses have endowed chairs is that campuses, not the system, must fund the chairs they decide to establish. Consequently, available financial resources at the campus level should be added as another determinant factor towards achievement in the endowed chairs mechanism. Finally, a third element of critical importance for the endowed chair success is the existence of graduate programs in which research can take place. In this respect, the situation is again unfavorable for most of the campuses. To illustrate, Cantú et al. (2005) report that only 6 of the 72 face-to-face Master's programs offered by the institution at that time were located at campuses other than the three largest ones. Regarding doctoral programs, the picture is very similar: the three largest campuses offered 8 of 9 programs. Confirming the imbalance, 88% of graduate students are enrolled in these three campuses. To make things worse, the 7 graduate programs operating outside of these

campuses are at risk of disappearing as a result of a recent institutional policy requiring all graduate programs to be categorized as excellent by CONACYT. As previously mentioned, relevant research activity is a primary criterion used by this agency for awarding the excellence distinction to graduate programs. After considering all of the above, the assertion that it “is very challenging to implement endowed chairs in all the institution’s campuses” seems obvious.

It seems very unlikely that the campuses at the forefront of the research strategy lose that position. To illustrate, on November 2005, Monterrey campus reported having 30 endowed chairs with 550 people engaged in them (“Exploran en,” 2005). Moreover, on January 2006, 14 new endowed chairs were added (“Generarán conocimiento,” 2006). Grooming Monterrey to become a research and teaching campus is an objective that some of its academic deans report as a priority (“Consolidación de,” 2006).

The situation just depicted in the last few paragraphs is in fully consonance with Hackman’s (1985) claims regarding resource allocation across units within universities. In accordance with Hackman’s theoretical framework, the three largest campuses of the Tecnológico de Monterrey are central to the institution’s mission of conducting research, a condition that translates into institutional resource gains. The referred campuses are considered central because they concentrate resources such as endowed chairs, faculty members holding a Ph.D. and membership to the SNI, and graduate students, all of which are critical for the achievement of the institution’s research goals. Those advantages associated with their centrality will dominate as long as the institution’s dependence on these campuses continues.

Technology parks. The establishment of technology parks is seen by Tecnológico de Monterrey as an alternative for the Mexican economy to become competitive within the knowledge economy and the institution is taking important steps towards its implementation. For this purpose, Monterrey city offers what seems to be the perfect setting. The city is converting its economy from manufacturing-based to knowledge-based and establishment of a technology park is among the strategies related to the conversion process. In words of one interviewee, “the state government’s interest in converting Monterrey city into a knowledge city has favored the engagement of Monterrey campus in research”.

The referred technology park began operating in early 2006 with the goal of promoting innovation and technology development in business and society. The project involves the state government, the CONACYT, and the three most important universities located in the referred city. Tecnológico de Monterrey is one of these three universities and its participation will focus on conducting research in Biotechnology, Nanotechnology, Mechatronics, Health, and Information and Communication Technologies (“Marcan el,” 2005). Accordingly, the institution’s Monterrey campus has established a Biotechnology Center. The center specializes in pharmaceuticals, food, bioprocesses, and agro-biotechnology. Along with the center, biotechnology-related degrees both at undergraduate and graduate levels have been added to the programs offered by the campus. Regarding the center’s pertinence to the intended goals, its director has declared that “through betting on Biotechnology, we are betting on moving us towards a knowledge-based economy...and we are not wrong.” (“Hacia una,” 2005).

The Center for Product Research and Strategic Design (CIDEP), currently under construction, is another contribution to the referred technology park. Initially, the center will provide services such as product design and product development directed towards the auto, electronic, appliance, medical, transport, and software industries (“Innovan con,” 2006). Inaugurated on February 2006, the Center for Innovation and Technology Transfer (CIT2) is the institution’s third contribution to the city’s technology park thus far. Furthermore, this center is presented as an example of Etzkowitz’ triple helix model of university-industry-government relations for the promotion of economic development. The center is also reported as having conceived the technology parks and business incubators operating in the cities of Barcelona, Spain, and Austin, Texas (“Fomentará CIT2,” 2006).

Business incubators. Along with technology parks, the establishment of technology-based business incubators is also among the VID’s goals. The vice president in charge recently stated that “regarding the private sector, the focus [of the vice presidency] is on technology parks, technology-based business incubators, and the identification of regions with potential for detonating development based on knowledge” (“Promoverán transferencia,” 2005). The establishment of business incubators is so critical to the Tecnológico de Monterrey’s research strategy that the position of associate vice-president for entrepreneurial development was created on April 2006 (“Crean nueva,” 2006).

The institution’s first business incubator was established in 2001. As of October 2005, 29 incubators were operating across most of the institution’s campuses, hosting 1,300 businesses in the incubation process (“Más apoyo,” 2005). It is noteworthy that the

majority of these businesses were not technology-based. However, the institution is thriving in attracting a greater number of technology-based businesses to the incubators. Fortunately, through grants targeting universities having technology-based businesses incubators and loans directed at businesses successfully incubated at these places, the Mexican government keeps on encouraging universities to participate in this endeavor. In fact, the institution's Monterrey campus has already received a half million dollar grant (Lezcano, 2005). Moreover, the Mexican government has praised the institution's achievements on the same matter by using other means. In October 2005, the Mexican federal Ministry of Economy awarded a prize to the Tecnológico de Monterrey in acknowledgment of its contribution to the consolidation of the Mexican system of business incubators. After receiving the prize, the institution's president anticipated an increase in both the number of businesses developed at the institution and the percentage of these businesses classified as technology-based ("Premian impulso," 2005). Aiming to serve the second purpose, the biotechnology center will host a biotechnology-based business incubator ("Desarrollarán la," 2006). By the same token, the CIT2 focuses on incubating technology-based businesses, facilitating their technology transfer activities, and accelerating the commercialization of new technologies ("Inauguran Centro," 2006). The institution plans to transfer the scheme which CIT2 operates to the rest of its campuses and is convinced that it propels wealth creation based on knowledge ("Transfieren conocimiento," 2006).

Finally, based on the assumption that the creation of knowledge-based business can be also favored by the establishment of academic degrees specifically designed for that

purpose, the Tecnológico de Monterrey has agreed with Babson College (renowned by its entrepreneurship programs) to offer a double Master's degree in both Business and Technological Innovation and Entrepreneurship Engineering. The agreement was signed on April 2006 ("Promoverán innovación," 2006). Additionally, an undergraduate program in Business Creation and Development is being offered by the institution at six of its campuses since the fall of 2005.

Networks. Given that the Tecnológico de Monterrey mission statement addresses the institution as a whole, that is, making no distinctions among its 33 campuses, it could be assumed the same regarding its research related goals. However, even before its current mission was presented, the institution has been signaling by different means that not all campuses are expected to contribute in the same way to the research strategy. Therefore, in addition to a focus on certain areas, the institution's research strategy aims to focus primarily on certain campuses. Specifically, the institution's 2003-2004 research report formally introduced eight of its campus sites as the only ones oriented towards conducting research (Cantú et al., 2005). Although there is not a ban on this, the rest of the campuses are not expected to engage in knowledge production activities. Remarkably, during the 2004-2005 academic year, the eight research-oriented campuses enrolled 75 percent of the institution's student body and employed 77 percent of its faculty holding a Ph.D. Additionally, from all the researchers within the institution who are members of the SNI, 99 percent were employed at these campuses. Other important research-related resources such as laboratories and equipment are also concentrated there.

From the theoretical perspective developed by Hackman (1985), it could be asserted that a campus labeled as research oriented means the institution considers it central to the achievement of its research goals and secures institutional resources for as long as it continues to be considered central. On the contrary, for a campus considered as non-research oriented, this means it stands alone regarding resources devoted to research.

Among this selected group of campuses being considered central to the institution's research strategy, Monterrey has been called to occupy a prominent position. Indeed, institution's president left no doubts on this after declaring:

Research is part of the Tecnológico de Monterrey mission. Our strategy postulates that we [the institution] must convert Monterrey campus into a leader of research focused on the knowledge economy. All our efforts and resources are being directed towards that goal (Rangel, 2005, p.44).

This strong declaration gains credibility when considering everything being done to create a privileged position for the Monterrey campus regarding research. Nonetheless, although remaining selective, the institution's official discourse tempers the situation with more inclusive variants. To exemplify, an academic dean expressed that:

Not all campuses must conduct research. However, in order to get things done, they should cooperate with those engaged in research. Communications from top administrators will influence whether or not the non-research oriented campuses decide to cooperate and there is certain institutional awareness of this. We [the institution] must keep on doing research under these premises because of our lack of resources.

Based on this perspective positing that, although different from each other, all campuses should play a role within the institution's research strategy; a top administrator asserted that "the mission embraces all campuses although we [the institution] have not yet put in place the right scheme for it to materialize. Some campuses are called to do

research while the rest are called to just transfer knowledge”. The assertion is in tone with another institution’s president declaration pointing out that “we [the institution] can not afford to have a laboratory neither a group of people [researchers] on each campus; we must concentrate it [research]” (Rangel, 2006).

The current concentration of research-related resources within the institution poses a real possibility for restratification across and within its campuses. Slaughter and Rhoades (2004) argue that the adoption of academic capitalist behaviors within organizations favors or heightens stratification. Regarding the Tecnológico de Monterrey, campuses labeled as non research-oriented are at disadvantage from the very moment they were categorized as such, regardless the amount of research-related resources they possess. Moreover, even among the research-oriented, it is evident that Monterrey campus is far ahead of the rest in engaging the institution’s research strategy. On the other hand, great differences across disciplines are already being observed. These differences simply reflect the disciplines’ different capacities to contribute to the referred research strategy. Therefore, it can be concluded that the adoption of academic capitalism by the institution is bringing sharper stratification.

Aiming to avoid the occurrence of some of the imbalances just presented, there is a consensus among all people interviewed that research networks represent an appropriate mechanism for allowing people across the institution to directly participate in research activities. As one interviewee voiced, “Through research networks, the institution is calling all campuses to participate in research”. Although there is a sense that these networks will be fund by the campuses, people within the organization is wondering how

networks can be built among campuses. Consequently, the fact that “the discourse among institution’s regional presidents is now addressing collaboration instead of competition” is promising. Nevertheless, the status quo currently prevailing at the Tecnológico de Monterrey makes the constitution of internal research networks a challenging task. One interviewee exemplified it by reporting that “there are some campuses working on similar technologies but isolated one from each other”. Inadequate administrative systems and procedures were also cited as obstacles to overcome in the establishment of the research networks; “the administrative systems are teaching-oriented as well as rigid and dissimilar across campuses” a top administrator argued. He also added that “human talent dispersed across disciplines and regions makes their integration into research networks within the institution more challenging”.

Paradoxically, the difficulties associated with the establishment of internal research networks are not preventing the institution from establishing research networks with other institutions. To exemplify, the Center for Health Innovation and Transfer (CITES) was recently created at Monterrey campus and will work jointly with Baylor College of Medicine, The Methodist DeBakey Heart Center, Johns Hopkins Medicine, Rice University, Texas Children’s Hospital, and The University of British Columbia to achieve its goals (“Dan a conocer,” 2006). Furthermore, an endowed chair associated with this center is operating with the participation of five researchers from outside the institution, each physically located at a different city: four in Mexico, one in the U.S. and those working for the institution’s Monterrey campus (“Enfocan investigación,” 2005). Another endowed chair aiming to conduct research for the modernization of software

systems functioning at governmental agencies in Latin America involves the participation of researchers from organizations located in eight different countries (“Fortalecerán modelos,” 2006). Regarding biotechnology, The University of Maryland, The Johns Hopkins University, and The Universidad Autónoma de Nuevo León have agreed to conduct joint research with The Tecnológico de Monterrey (“Apoyarán estudios,” 2005). On the other hand, the institution has recently agreed with Carnegie Mellon Software Engineering Institute on working together to facilitate the increased quality of software made in Mexico (“Impulsarán calidad,” 2006). Finally, with the objective of helping the business community cope with globalization and internationalization, the institution recently created The Family Business Institute in partnership with the Spanish institution *El Instituto de Empresa* (“Apoyarán en,” 2005). Unfortunately, these associations involve Monterrey campus almost exclusively.

Technology transfer. The commercialization of knowledge clearly has a high priority within the Tecnológico de Monterrey’s research strategy. Similar to the self-sufficiency criterion for research, it is seen as a mechanism to fund further applied research and to eventually enter into conducting basic research. There is agreement among interviewees that protecting intellectual property, demanding patents from researchers, establishing technology parks and technology-based incubators, promoting technology-based spin-offs among its faculty, and having a licensing office should all be considered by the institution when approaching commercialization of knowledge. Actually, some of these elements are already present in some of the research-related projects the institution has in place. To illustrate, in order to be incubated in the Center for Innovation and Technology

Transfer, businesses must have a strategy for intellectual property management, either through patenting or copyrighting (“Transfieren conocimiento,” 2005). On the other hand, high expectations regarding patent production and its potential for income generation have been placed on endowed chairs. These expectations have developed from the fact that for the first time in its history the institution has developed some inventions as a result of research conducted by the endowed chairs (“Exploran en,” 2005). Accordingly, the Monterrey campus dean of research and graduate programs has declared that “...in five years we expect to have about 50 to 60 patents registered, a ‘big shot’ could result from them allowing us to reach a market niche as well as to finance more research” (“Generarán conocimiento,” 2006).

The high expectations regarding revenue streams resulting from the institution’s approach, in particular from the commercialization of knowledge, signal again the presence of academic capitalism within the Tecnológico de Monterrey. In this respect, the theory of academic capitalism underscores that university policies aimed at protecting intellectual property introduce capitalism into academia. Specifically, Slaughter and Rhoades (2004) argue that these policies lead universities to shift from a knowledge/learning regime, which considers knowledge as a public good, to an academic capitalist knowledge/learning regime, which views knowledge as a product to be owned.

Under an academic capitalist regime, a university’s pursuit of patenting discovery obstructs the free flow of knowledge. Indeed, Slaughter and Rhoades (2004) found that patenting may delay publishing, especially in the case of professors with no close relations to the industry. Their findings also point out that a significant number of the

professors they interviewed welcomed the idea of having publishing and patenting among their activities. On the other hand, patent policies also enable new circuits of knowledge; they introduce new actors who will decide the fate of knowledge based on its commercial possibilities. In this regard, many of the statements made by the people interviewed at the Tecnológico de Monterrey as well as those excerpted from the analyzed documents leave no doubt that the institution is planning to play a decisive role in the fate of knowledge created by its people.

The theory of academic capitalism also stresses that economic incentives often attached to patent policies cause researchers to take a different stand on their work output. That is, patent policies vanish disinterestedness from scientists' minds. The expectation that economic benefits might result from their research is likely to shape what researchers at the Tecnológico de Monterrey do as well as how it is conducted.

Academic capitalism also manifests itself when a university's patent policies discourage scientists from questioning the results of their research. As a result, the possibility of finding better alternatives is not pursued because a later result may negate the revenue reward possibilities. Of course, scientists at the subject institution for this study are not exempt from developing this conduct.

Despite the shared agreement on pursuing commercialization of knowledge, questions far exceed answers regarding the way the issue should be best approached. Statements like: "How we should promote spin-offs among professors?"; "How should we manage the economic benefits reaped through commercialization of discoveries by our faculty?"; "We must work on intellectual property"; and "Demanding patents from researchers

could head them to patenting useless things” reflect what some of the institution’s decision makers have in mind regarding this matter. Fortunately, there is also acknowledgement regarding the limitations that prevent the institution from designing and implementing a sound strategy. The words of an interviewee better illustrate this: “We know so little, have so little experience and there are so many things to do that there is chance for us to not choose the right direction on this”.

Given its lack of knowledge and experience, the institution has contracted an external consultant to help put together an effective strategy for commercialization of knowledge or, citing a top institution’s administrator, for taking advantage of the “businesses of the future: patents, licensing, spin-off companies”. Interestingly, this administrator reported that she realized the consultant had grasped the institution’s aspirations when he referred to it as “an organization hungering for connecting knowledge to business”. These declarations somehow resemble the start-up stories that Slaughter and Rhoades (2004) utilize to exemplify the introduction of academic capitalism into academe. The stories stress how professors are seduced by the idea of becoming rich from participating in start-up companies that commercialize their discoveries without considering how likely that is to happen. For institutions, the potential for results creates expectations of sharing the referred economic benefits. In reference to the Tecnológico de Monterrey, the findings of this study show no clear evidence that policy and decision makers within the institution are approaching commercialization of knowledge in a different way than any for-profit organization would choose. Consequently, it is fair to claim that while setting

the conditions for commercialization of knowledge the institution will facilitate the encroachment of academic capitalism within it as well.

Along with hiring the external consultant, the institution has also joined an organization called Kick Start: Key Initiatives in the Commercialisation of Knowledge (ALFA-Project). On its website, the organization is introduced as a project of cooperation between European and Latin American universities with the “main objective of developing regionally specific initiatives focusing on fomentation of academic entrepreneurship and establishment of a transnational, interactive model for knowledge management in research institutions”.

The search for an appropriate formula on knowledge commercialization has also forced the institution to look into what other universities are doing. Specifically, on schedule is the study of technology transfer offices at universities located in the United States such as California, Texas, Massachusetts, and Arizona. Moreover, the concern about the issue is favoring the design of a joint Master’s degree on Management and Commercialization of Innovation and Technology Development, which will be offered in combination with the University of Texas at Austin in the near future. On the other hand, the complexity associated with having a large and diverse number of campuses has driven the Tecnológico de Monterrey to become interested in initiatives such as the Public Research Organisations Transfer Offices Network-Europe, abbreviated as ProTon Europe, a not-for-profit association created by European Union’s decree on December 7, 2005. Its purpose is to promote innovation in Europe by a more effective knowledge transfer from universities and other research organisations funded primarily by public

funds. Among its specific objectives are the establishment of a professional association of knowledge transfer offices from public research organizations representative at the European level and the facilitation of networking among such transfer offices.

Considering the lack of definition still present in many aspects of the Tecnológico de Monterrey's strategy for commercialization of knowledge, it is foreseeable that the institution will end up mimicking other institutions perceived as having in place sound strategies aimed at the issue in question. That is, the institution will engage in isomorphic change seeking external legitimacy rather than efficiency (DiMaggio & Powell, 1983). The high level of uncertainty between means and ends associated with the institution's commercialization strategy acts as an incentive for institutional isomorphism – specifically, mimetic isomorphism. Consequently, the Tecnológico de Monterrey will model itself after those organizations perceived as successful in the commercialization of knowledge endeavor.

Recapitulating, the institution's active search for the appropriate strategy to engage in the commercialization of knowledge might lead it to adopt an approach, in part, similar to those in place at other universities and, in part, distinct given its unique characteristics. In fact, a top administrator shows awareness of this when saying that “our intended model is so new that there is nobody to copy from”. Last but not least, it is very likely that the isomorphic change also brings a good dose of academic capitalism to the Tecnológico de Monterrey given the pervasiveness of academic capitalism among American research universities (Slaughter & Rhoades, 2004).

Prestige. Early in this chapter, it was mentioned that Tecnológico de Monterrey is pursuing research as an apposite way of fulfilling its commitment to Mexico's development. Nevertheless, research is also appealing for the institution because it brings prestige, which is considered within the institution as an effective way of differentiation from competitors. Until recently, the institution had considered other Mexican private elite institutions, charging high tuition as its only competitors. However, this is no longer the case since the improvement in the quality of education offered by other private institutions charging lower tuition has become evident for students. Consequently, statements like: "We must conduct research to differentiate the institution from the rest" appear congruent with this rationale.

The actions that the institution is taking to differentiate from its competitors, considered as non-prestigious, are also taking it become increasingly similar to other institutions, allegedly prestigious. Accordingly, Tecnológico de Monterrey is complying with all that a prestigious university is supposed to be. Specifically, the institution is currently seeking to maintain its international accreditation with the Commission on Colleges of the Southern Association of Colleges and Schools (SACS). Serving this purpose, many changes have been introduced into the institution ever since it gained its accreditation in 1950. Perhaps one of the most significant changes derived from SACS' request that, by the year 2000, 25% of undergraduate specialization courses and all graduate courses at the institution must be taught by professors with doctoral degrees. The decisions made in compliance with this requirement have resulted in uneven concentration of faculty with doctoral degrees across the institution's campuses. To

exemplify, the high concentration of this type of faculty at Monterrey campus can be linked to the policy that this campus implemented in 1998 requiring that all of its future full-time professors must have doctoral degrees. This policy forced many professors to improve their academic credentials and, as a consequence, their research profile.

Obviously, other campuses approached the SACS request differently.

Along with accreditations granted to the institution as a whole, differentiation can also be approached by gaining accreditations for individual academic programs or units. Hence, Tecnológico de Monterrey is also actively engaged in this matter by asking all campuses to have all undergraduate and graduate programs accredited at least for a domestic agency. In accordance with this requirement, campuses are supposed to close those programs failing to gain or maintain accreditation. Moreover, campuses are expected to provide the programs with all the necessary resources for earning the referred status. This constraint usually prevents the majority of campuses from having graduate programs because CONACYT, which actually grants accreditation to graduate programs, utilizes standards difficult to meet even by the more equipped campuses. Its evaluation criteria comprise elements such as relevant research activity, academic credentials and membership of its faculty to the SNI, and publishing among the most important. Thus, in order to get its programs accredited, campuses like Monterrey include these elements as part of its internal goals (“Consolidación de,” 2006). Finally, accreditations are bringing in students and funding. Mexican agencies related to higher education are currently awarding scholarships to students planning to enroll in accredited programs and

universities are obtaining research grants linked to these accredited programs (Eggers, 2005).

Eager to differentiate as much as possible, some campuses –usually the wealthiest- are taking its programs or units beyond domestic accreditations. They are turning to primarily international accreditations, usually with higher or more difficult requirements. When succeeding, these campuses end up bragging about having their programs accredited by agencies such as The Association to Advance Collegiate Schools of Business (AACSB), the Accreditation Board for Engineering and Technology (ABET), the European Foundation for Management Development (EFMD), the National Architectural Accreditation Board (NAAB), the Institute of Food Technologists (IFT), and the Association for Public Policy Analysis and management (APPAM) in addition to the domestic agencies. For better or worse, this is translating into campuses differentiated not only from outside competitors but also from within the Tecnológico de Monterrey. To illustrate, the institution’s Graduate School of Public Administration and Public Policy (EGAP), which operates only at the three largest campuses (Monterrey, Ciudad de México, and Estado de México) was recently accredited by APPAM and its dean declared that “being part of APPAM will place EGAP in a elite to which access is granted just for a handful of schools....All important American schools of public administration are in APPAM”. Harvard, Princeton, Carnegie Mellon, MIT, and Johns Hopkins were mentioned as an example of such important schools (“Ingresa EGAP,” 2006).

It is notable to underscore that the pursuit of accreditations, either domestic or international, has also taken the Tecnológico de Monterrey as a whole to engage in institutional isomorphic change. DiMaggio and Powell (1983) posit that organizations become involve in institutional isomorphic changes when competing for external legitimacy, which is the case of the institution object of this study. In order to attain legitimacy/prestige, the institution is willing to comply with the requirements imposed by the accreditations agencies, disregarding how much efficiency this might return to the institution. A university's desire to be accredited stems from the increasing demands exerted by their stakeholders in that direction. Interestingly, a university's response to the stakeholders' demands translates into investing accreditation agencies with coercive power over those seeking accreditation. That explains why this mechanism of change is called coercive isomorphism. In the end, compliance with the criteria for accreditation drives universities to become more similar. Hence, by gaining accreditation(s), the Tecnológico de Monterrey is simultaneously becoming similar to those opting for the same while also being different from the rest.

International accreditations, particularly those granted by American renowned agencies, ease an institution's entrance into the rankings. Tecnológico de Monterrey is fully aware of this and taking advantage of it. What makes rankings so enviable is that for either an institution, unit, or program, attaining a rank translates into prestige. To illustrate, the institution's 2005 annual report emphasizes that its Monterrey campus Graduate School of Administration and Leadership (EGADE) kept its prestige in both the national and the international arenas. The report specifies that *América Economía*, a Latin

American magazine, has ranked EGADE first in Latin America in five of the last eight years. It is also stressed that during 2005, *The Wall Street Journal* ranked EGADE ninth in North America, *Financial Times* placed it among the world's 100 best, and *The Economist* ranked it as 68th among the best 100 globally, being the only Latin American School included (p. 37). Unsurprisingly, a keen interest in catching up with those rankings and accreditation is now present at Ciudad de México, Estado de México, Guadalajara, and Toluca campuses, the only other campus locations with EGADE.

Despite the fact that both accreditations and rankings are a source of prestige for the Tecnológico de Monterrey, it is vital for the identification of academic capitalism to draw distinctions between the two. Accreditation processes are largely based on scholarly peer review, a characteristic associated with the public good knowledge/learning regime (Slaughter & Rhoades, 2004). Conversely, the rankings signal the presence of the academic capitalist knowledge/learning regime. In this respect, academic capitalism develops primarily because outsiders to the educational profession determine the position of a university or college in the rank. The judgment variables are often dissimilar to those considered by the accreditation agencies and are, rather, linked to the concept of education as a commodity to commercialize, just as in any other market. Consequently, conclusions regarding an institution's rating by these two groups may vary widely. Moreover, new circuits of knowledge are created as long as institutions remain concerned with and behaving in accordance to the rankings. Evaluation of university or college performance is therefore not longer exclusively the domain of academia. Considering all of the above, it is fair to say that the willingness of Tecnológico de Monterrey to comply

with the exigencies of both accreditation agencies and organizations responsible for the rankings is conducive to the coexistence of institutional behaviors in congruence with the two knowledge/learning regimes.

Arguing the necessity for further differentiation from its domestic competitors and for more prestige in relation to international universities, the Tecnológico de Monterrey's admission standards were raised for those entering the institution in fall 2006. When first officially introduced, the decision was referred to as a natural consequence of the institutional process that first required faculty to increase their academic credentials and then required programs to gain accreditation ("Por el," 2005). Justifying the decision, the institution president stated that "the Tecnológico de Monterrey wants to be a world benchmark just like Harvard, Yale, or MIT" (Castañeda, 2005b). By the same token, he also declared that "because we want the best [students] to come, we will convert the institution into a very selective one" (Castañeda, 2005a). To complete the picture, the official discourse also stresses that the institution will be in better position to conduct relevant research by having stellar faculty and students as well as high quality academic programs (i.e., accredited). Nonetheless, a top administrator warns that the institution will likely see a decrease in its student population associated with the rise in the admission standards, especially considering the impact that fewer yet better qualified students might have on research. That is, fewer students translate into less income for the institution, which might translate into less internal allocations to research. In fact, another interviewee said that, anticipating the referred decrease, some of the institution's regional presidents are asking the campuses under their jurisdiction to discourage faculty from

obtaining membership in the SNI. Faculty members receive their salary increase during the time they maintain membership in the SNI.

Although the real impact that the rise in admission standards will have on research is still uncertain, enrollment statistics relative to the fall 2006 academic period have been made public. Addressed by satellite on August 28, 2006, alumni of the Tecnológico de Monterrey were informed by the institution's president that, as a result of the new admission standards, the applicant rejection rate went up from 22% to 47%. He added that 46% of the 2006 freshmen class is now comprised of high achievers, a big step forward when considering the 33% level observed two years prior. The institution considers high achievers as those having a high school GPA of at least 9, based on a 1 to 10 grading scale. It is important to mention that students with a high school GPA below 8 are no longer admitted. Taking pride in this, the institution president also anticipated that in the future "the institution will become highly desirable and selective".

It could be argued that Tecnológico de Monterrey's raised admission standards constitute another way of triggering mimetic isomorphism. Nonetheless, it is clear that the institution's need for external legitimacy remains the driving force behind organizational change. In accordance with DiMaggio and Powell's (1983) thesis, the institution is trying to emulate other universities –this time their admission practices– because it perceives them as highly valued. It is important to keep in mind that this perception gave no consideration to efficiency. Of no lesser importance is the fact that, regarding research, the institution is trying to emulate the UNAM as well as American research universities in the domestic and international arenas respectively.

Lastly, either imitating the Tecnológico de Monterrey, other universities, or just by coincidence, other Mexican higher education institutions are engaging in similar initiatives. To illustrate, the Universidad Autónoma de Guadalajara recently announced plans to construct a technology park. The park will promote applied research as well as the establishment of technology-based business incubators. The project was presented as necessary, arguing that most universities in the U.S. and many in Europe are already involved in this type of endeavor (“Construirá la,” 2005). On the other hand, aiming to strengthen the state’s economy as well as to generate employment, the Universidad de Guanajuato has established a business incubator (“Inaugura Centros,” 2005). Finally, aiming to develop entrepreneurial skills in students, a network of business incubators was established across the 59 existent technological universities (public 2-year colleges). Their curriculum was also modified targeting the same goal (“Fomentan formación,” 2005). From the above, the prevalence of institutional isomorphism is evident across the higher education organizational field.

Inadequacies. The institution’s research strategy also contemplates dealing with organizational inadequacies that, if not resolved, will prevent it from succeeding. Perhaps one of the most challenging issues to deal with is the way research is still perceived within the institution. A top administrator complained about the widely shared paradigm that sees research as a cost rather than as an investment. Addressing the same issue, an academic dean expressed that “knowing that sometimes results could not be reached shortly, institution and faculty’s long term investment and commitment to research are critical” for the strategy to thrive. Another interviewee pointed that “having campus

presidents and rectors with a good understanding of what research is about” could make the difference between failure and success on the research endeavor.

Inadequate administrative procedures, structures, and/or personnel were also identified as significant obstacles to overcome. All the interviewees underlined the importance of having appropriate internal reward systems and clarity of rules. Moreover, one of them acknowledged that:

We [the institution] have to implement different administrative procedures that effectively support the research activities. If we fail to do it, professor’s initiative will get drowned. We are doing things inefficiently by having professors distracted by complying with cumbersome internal administrative procedures instead of doing research.

The last issue targeted resource allocation towards research. It was mentioned that not consensus among the institution’s rectors have been reached regarding the amount of resources to allocate towards research. This is viewed as important because official, specific goals regarding research signals to everyone within the institution about what is expected to be accomplished.

Conclusions

The findings suggest that a commitment to contributing in the generation of greater well-being in Mexico’s communities is the main driving force behind the Tecnológico de Monterrey’s research orientation. Indeed, a strategy favoring applied rather than basic research as the primary type of research to be pursued by the institution and a focus on certain areas has been developed in order to fulfill that commitment. Additionally, it has been underscored that the commercialization of knowledge is at the core of the university’s research strategy. This leaves no doubts about the pervasiveness of academic

capitalism within the Tecnológico de Monterrey. Clear signs of isomorphic change are also evident in the institution's reorientation process. Furthermore, the referred strategy evidences disregard for the reality facing small campuses within the Tecnológico de Monterrey as well as negligence for disciplines with limited capacity to attract external funding. The findings also show that centrality and power are useful concepts for explaining disparities among campuses regarding resource allocation.

CHAPTER V: FINDINGS AT THE CAMPUS LEVEL

Introduction

The decision that led the Tecnológico de Monterrey to include research as a central part of its mission was not made at its campus level. Nonetheless, it is fair to say that this is the level where the final fate of the research commitment will be decided. Therefore, it became critically important to investigate the extent to which people at the institution's campus level are resistant or committed to the institution's research goal. This chapter presents the results of that undertaking. The implications that the institution's research strategy has at the campus level are also addressed.

The findings are organized in two sections, one for each of the campuses sampled for this study. The first section addresses the institution's León campus, a unit that aspires to engage in research in spite of being considered as non-research oriented. In this section, opinions from León campus' administrators, academic administrators, and professors offer perspectives additional to the ones collected at the system level regarding the institution's motives for research engagement as well as an assessment of what is being done and what should be done at the campus regarding research. The second section focuses on the Querétaro campus, considered by the institution as a research oriented campus. Information from interviews with people exhibiting similar profiles to those interviewed at León campus is presented, following the same sequence used in the first section. This made it possible to compare and contrast the two campuses and to compare

the findings at the campus level with those at the system level reported in the previous chapter.

The institution's León campus

The rationale for research

Although sometimes expressed in different ways, there is a wide coincidence between people interviewed at the institution's León campus and those occupying top positions at the institution's system level regarding what is behind the Tecnológico de Monterrey's commitment to research. Frequent exposure to the president's discourse on research as well as to the sentiments echoed by other top administrators are good examples of this concurrence. Actually, some people even cited them when addressing the issue.

As expected, top campus administrators' rationale for research was aligned with that of the institution's president. They stressed the necessity for the institution to act as an engine for the country's economic development. One of them added that the institution's commitment to research stems from "the acknowledgment that only through research as well as innovation and applied technology the institution will be able to contribute to the country's development". It is noteworthy to mention that some of the people interviewed were in concordance with these statements, albeit they mentioned regional or local development as specific targets of research conducted by the institution. Moreover, many of the collected opinions reflect a rich diversity of understandings regarding the very same issue. They follow next.

Congruence with both what the institution preaches and its mission were the way some justified the institution's engagement in research. In respect to this, an academic administrator declared himself convinced that "the institution wants to engage in research seeking congruence with its preaching about being the best university". In the same tone,

a professor declared that “the institution is interested in research because it has to prove that it is the best; otherwise, it will lose credibility”. On the other hand, a center’s director assured that “we [the institution] do research to fulfill the institution’s mission regarding the promotion of regional development”. From his perspective, research makes the institution “become a pillar of the country’s development, positioning it as a change agent”. Finally, some of the interviewees see the renewed institution’s interest in research as simply reflecting its willingness towards following a worldwide tendency of having universities increasingly committed to research. They added that this willingness increases when considering that “institution’s Mexican peers are already contributing through research to improve society”.

For some people, responding to its stakeholders’ demands and/or expectations is what better explains the institution’s current engagement in research. Hence, this perspective visualizes the referred engagement as a reaction or obligation rather than as an initiative. In words of one professor, “the institution is willing to do research because universities are supposed to do it for the sake of knowledge”. Going even deeper, another professor asserted that:

The Tecnológico de Monterrey is willing to pursue research facing its responsibility as knowledge creator....It is also its responsibility to help towards the country’s transformation. We must help our country; otherwise we might end up being the better higher education institution of the worst country....If we ask ourselves as an institution about our contributions to society regarding knowledge, we might have to admit that the UNAM [the largest public Mexican university] has made better contributions.

By the same token, another interviewee expressed that “the Tecnológico de Monterrey is pursuing research to meet societal demands regarding institutional

contribution to improve the population's living standards...The institution must conduct research; society is expecting that to happen". Another interviewee expressed that commitment to research is present after the institution "came to the realization that because of its size and national presence, it is expected to do research for the society and country's benefit". In his opinion, the institution is obligated to conduct research in order to help the country to become competitive. On the other hand, institution's stakeholders are also allegedly pushing the institution into research. Indeed, a center's director assured that "they [stakeholders] demanded research through the 2015 mission's consultation process". According to the institution's website, the consultation process he referred to involved 14,815 participants. Moreover, while introducing the institution's 2015 mission its president states:

The present text brings together the expectations of Tecnológico de Monterrey's trustees, students and faculty, alumni and important Mexican leaders who have reflected on what Tecnológico de Monterrey must do during the next decade to respond to the important changes taking place in society, and particularly, to the challenges for development that the country is currently facing.

Reflecting on how the institution's faculty composition has changed along the years, another center's director posited that "we [the institution] now have less inbreeding and more people with PhDs. Consequently, faculty is demanding more research". The existence of this kind of people is also considered an asset and research, in opinion of an academic administrator, is the way the institution has chosen to exploit the full potential of such trained personnel. A more benign approach to this fact argues that "the institution wants to help its professors to develop a career as a researcher in accordance with the pre-existent institutional scheme created for that purpose". The cited scheme, which went into

effect since 1990, delineates the paths that Tecnológico de Monterrey professors should follow in order to become researchers. Through either improving their academic credentials, engaging in research-related activities, or both, professors move forward within an associated classification system especially towards that goal. Advancement within the classification system brings economic benefits to the professors from the institution. Alas, the scheme has barely produced the desired results. A final version of the reactive approach posits that the institution is engaging in research to prepare for receiving more high-achieving students once the new admission standards are in effect.

A different set of reasons were also expressed in reference to the institution's motivation for research. This set claims that research is being pursued because it helps the institution overcome deficiencies as well as differentiate itself from its competitors. To illustrate, for a professor, "research will improve our [the institution] image before society". By the same token, another professor expressed that "the absence of research has kept the institution from being close to the community. Hence, it would get a greater recognition if decides to conduct research". Regarding differentiation, a center's director assured that, "through research we would be seen more as a university....It is known that the best universities worldwide do a lot of research". Addressing a possible consequence of the lack of research activity, an academic administrator articulated that:

If the institution keeps on not conducting research, it will not differentiate from the rest. Consequently, it will become less attractive to students and this is serious because this August [2006] we will receive more demanding students whom might be better served by doing research.

Prestige was also expressly mentioned as a direct benefit from research. Moreover, a center's director assured that "both the institution and its professors are in need of

prestige and because prestigious universities do research, so we have to do accordingly”. On the other hand, some of the interviewees also agreed to the possibility that research is being pursued because it also takes the institution to the forefront of knowledge creation. Finally, the necessity of developing stronger ties with the industry is why an academic administrator encourages the institution to engage in research.

Utilizing the theoretical framework upon which this study relies, many interviewee responses addressing the rationales behind the institution’s commitment to research are helpful in making again the case for institutional isomorphism at the Tecnológico de Monterrey. Indeed, the three mechanisms through which institutional isomorphic change occurs can be identified. Respondents stress that the institution’s orientation to research responds to stakeholders’ demands and expectations on the institution, therefore fueling coercive isomorphism. On the other hand, responses pointing at prestige and image improvement for the institution as causes of its research commitment signal the existence of mimetic isomorphism. Lastly, the fact that the increase in the number of people within the institution holding Ph.D.s granted by institutions other than the Tecnológico de Monterrey had been mentioned as a push for engagement in research, providing additional evidence for the presence of normative isomorphism. In this respect, it is noteworthy to mention that none of the people interviewed at the system level recognized the causality just pointed out.

Supporting what DiMaggio and Powell (1983) state, efficiency was never mentioned as a driving force behind the institution’s orientation to conduct research. On the contrary, a high desire for legitimation was always present in the interviewees’ responses.

Despite the fair level of agreement among the people interviewed with the official rationale for research, a couple of academic administrators immediately contrasted their initial agreement with reality at León campus. After arguing that the institution is interested in research because of its association with prestige, one of them added that “the commitment to research does not make any sense when considering the faculty retrenchment the campus has been dealing with. It is offensive”. The retrenchment he referred to has reduced the number of full-time faculty teaching undergraduates from 44 during the fall 2002 academic semester to 21 during the spring 2006 academic semester. Moreover, derived from the last layoff just in December 2005, the academic deans are now playing the role of academic department heads, too. Given these circumstances, the overwhelming feelings externalized by many of the interviewees appear totally understandable. Indeed, one academic administrator stated that:

I am very busy...I need time to think, to figure out how to better organize my work; it is not possible to work in these conditions...My people complain that I am not visiting them at their offices just to know how they are doing.

By the same token, another academic administrator completed the picture by stating that “it does not make sense the declaration of research whereas a professor must teach 5 courses each semester. Additionally, there are no indicators at León campus for measuring research performance”.

The campus research strategy

Based on what a top campus administrator voiced, no research is currently the campus research strategy. This is unsurprising after considering that the campus has not been labeled by the institution as research oriented (Cantú et al., 2005). Nonetheless, this

administrator acknowledged that, in the past, some of the campus professors conducted research. However, he added that for various reasons many of these professors are no longer working for the campus.

Although the institution's research strategy does not include a ban on research for any of the non-research oriented campuses, an academic administrator reported that León campus was not conducting research. This fact is simply in concordance with his assertion that "research is currently not among the campus goals". Instead, "strengthening teaching is the main priority", which is congruent with his vision that "small and medium size campuses may focus on assuring the quality of teaching. Failing to do it may be dangerous". He sees knowledge transfer as the alternative for research. Moreover, citing the institution's president, he asserted that "all campuses should become knowledge transfer centers, no matter how much research they are conducting".

In accordance with the plans of strengthening teaching at the campus along with orienting it towards knowledge transfer, six centers were recently created. They are: the Retailing Center, the Asia-Pacific Center, the Center for Innovation, the Center for International Case Studies, the Center for Information Technologies, and the Center for Intelligence and Industrial Logistics. All were conceived as branches of centers already established at Guadalajara campus, a research oriented campus acting as the flagship campus of the institution's west zone. The administrator further explained that all centers were conceived for the enhancement of the undergraduate programs, to offer training for the local businesses and industry as well as for consultancy and technology application. Nonetheless, he added that eventually, research oriented to regional needs could be

considered as part of the centers' core activities. In addition, research is currently not a completely discarded activity for campus faculty. They can engage in it by joining the research networks which the institution as a whole will supposedly help to configure.

Supporting this possibility, an academic administrator commented that:

We [the institution] should aspire to develop a research network among our campuses that keep us from setting research facilities in every campus....The network should also allow each campus to distribute knowledge resulted from research conducted either inside or outside the institution.

Furthermore, aware of the existence of several research centers located near the campus surroundings, he posited that collaboration with them is a much better option than trying to establish research centers at León campus. On the other hand, he assured that the official institutional discourse encourages its different campuses to associate among them in order to take advantage of the research opportunities. The discourse appears to be in consonance with his visualization of the institution as "having several arms [campuses] doing different things in order to complement each other".

Type of research

Interestingly enough, nobody declared that the Tecnológico de Monterrey should not be committed to research. Regarding its type, with the exception of one interviewee in favor of only basic research, the rest considered that either applied or applied and basic research should be pursued at the institution. It is noteworthy to say that three of the four mentions who favored both applied and basic research came from full-time faculty members. Therefore, basic research was almost always included in the professors' research formula. However, a very different picture resulted when considering the campus administrators because they never considered basic research in their formulas.

Those inclined exclusively towards applied research sustained their position by arguing that applied research is what Mexico needs most to catch up with the developed world as well as to solve some of the many problems prevalent in Mexican communities. They appeared convinced that research must be conducted with an application in mind. Their rationale also stressed that applied research would help the institution to fulfill its responsibility to contribute to the country's development. Its alleged capability to quickly produce tangible results translated into societal benefits, such as higher employment levels. Additionally, arguments ranging from higher outside visibility to institutional lack of infrastructure in order to conduct basic research were expressed in support of conducting applied research. Finally, some interviewees supported applied research after acknowledging that through it the institution would better exploit its strengths.

Interestingly enough, those who included basic research in the formula for research orientation justified its inclusion, arguing that it would help the institution to earn international recognition and prestige. It was also mentioned that basic research should be conducted only by those campuses that can afford it.

Focus of research

When asked about the focus for research pursued within the institution, interviewee responses addressed both the institutional and the campus levels. Remarkably, these responses barely referred to a specific field or area on which to focus. Regarding the institutional level, the country's interests and community's needs were targeted. In addition, it was mentioned that research should focus only on a few specific areas. In respect to the focus for research at the campus level, two of the interviewees posited that

the decision should be made by the institution at its system level in combination with the campus. Nonetheless, many of the other responses stressed that research conducted by the campus must be directed to help the surrounding community overcome its problems. Industry-related problems were most frequently mentioned when further information was required. Specifically, local industry's lack of competitiveness was repeatedly raised. Finally, some interviewees stated that research conducted by the campus should concentrate on niches that allowing the campus to take advantage of its competencies. Alas, no one explained what the campus competencies could be.

Who are called to do research?

Largely coinciding with the institutional discourse, all except for one of the people interviewed backed the scenario in which campuses do not contribute to the research strategy in the same way. In other words, almost everyone agreed that not all campuses are called to do research, which does not translate into no participation in the institution's research strategy. Therefore, the bottom line is to determine the level and type of involvement. Some opinions pointed out that research should be reserved for large campuses, whereas small and medium sized campuses should focus on teaching. The rationale behind this is that large campuses have both vocation and resources for research along with local or regional support from the community. In addition, some people –none of them professors- expressed that concentrating knowledge creation in a few campuses is more efficient. To exemplify, a center's director stated that “the mission does not and should not include participation from all campuses regarding research. Otherwise, the institution will become inefficient. Research must concentrate in some campuses and

areas. It is the best in terms of resource exploitation”. By the same token, an academic administrator stated that:

All campuses should participate but not at the same time, besides small campuses do not like the idea. Resources must be concentrated in a few campuses and research centers first and the rest should be incorporated once they become strong. It is better to allocate \$100 in a single place than \$10 in ten different locations.

On the other hand, small campuses supposedly do not have research vocation and/or are not engaged in it because they are striving for survival due to their small student populations.

The rationale presented above appears suitable for the development of behaviors and policies associated with academic capitalism (Slaughter & Rhoades, 2004). That is, the Tecnológico de Monterrey is immersed in academic capitalism by making decisions about which campuses and disciplines should engage in research, based upon criteria praising efficiency, closeness to the market, and/or vocation. Additionally, the declarations related to the rationale show no awareness of the impact that stratification across and within the institution's campuses could produce. In this respect, Slaughter and Rhoades (2004) posit that when it comes to universities engaged in academic capitalism, the amount of benefits and rewards that their units will receive depends upon the units' ability to get close to the market.

Also backing the not-all-participating alternative from a different perspective, a full-time professor voiced that “the cost-effectiveness institutional approach to research makes contributions from small and medium size campuses more challenging”, if not impossible. A different rationale pointed out that research is not officially banned for anyone, yet some campuses, especially small ones, are not conducting it simply because

it is not being promoted within these campuses. Instead, “campus authorities are requesting us [the faculty] to do things different from research” said a full-time professor who was not the only one thinking that way.

Regarding alternatives for those campuses not engaged in knowledge creation, the responses pointed to participation in knowledge transfer and research networks. Accordingly, a good deal of extension courses is expected to result from the six centers recently established at the León campus. Nonetheless, four academic administrators stated that research should also be pursued at these units. For them, research would take the campus to a better position among local universities. On the other hand, research networks are expected to act as the mechanism making possible the dissemination of discoveries across all the institution’s campuses. These discoveries may or may not originate from research conducted within the institution. In addition, some of the interviewees mentioned that, by design, research networks constitute the mechanism for any faculty member located at any campus to actively participate in conducting research. All he/she need do is join, through the network, a research team working on the topic in which he/she is interested. Hence, it is theoretically possible for professors working at non-research oriented campuses to pursue research. Moreover, a center’s director praised networks, stating that “we should avoid individual efforts regarding research; it is wasteful. Instead, research participation through networks should be promoted and affordable for any professor located at any non-research oriented campus”. Nevertheless, collaborative work is indispensable for the networks to function properly and that, in words of a top administrator, “has always been a challenge within the

institution....Usually, every campus aspires to both do and have everything”. In addition, some of the interviewees warned about undesirable outcomes that could be associated with the research networks, specifically when a professor from one campus joins a team of researchers located at a different campus, working on research considered not of interest for the professor’s campus. In this respect, a full-time professor stated that:

Concentrating the scarce resources available for research in a handful of campuses has the advantage of greater effectiveness. However, it has the disadvantage of condemning the rest wanting to participate, to adhere to the leaders and to follow their already defined research lines. This could be not in the best interests for the communities in which the follower campuses are located. Actually, I am convinced that this is happening.

By the same token, an academic administrator criticized what he referred to as the institutional strategy of building research networks targeting the largest campuses as its hubs. The strategy, he added, “cancels any possibility for small campuses to propel research”. As a way of avoiding the above scenario and taking full advantage of all the institution’s campuses, the only interviewee (a full time professor) in favor of research at all campuses proposed that “each of them should conduct research but specialized in an area different from the rest; just like in a soccer team, not all the 11 players get the goalkeeper position”. Unfortunately, he added, “what is currently happening with us [the institution] is that only five to six players are in the field while the rest are benched”.

Addressing the same issue, albeit from a different perspective, an academic administrator stated that:

Those campuses with no research activities [benched] are condemn to remaining simply as one of the many existent teaching schools, with the disadvantage that there are a lot good quality, low-cost competitors in that segment....Absence of research will also intellectually demotivate both professors and students.

Also underscoring the advantages of research, an academic administrator made his point by assuring that “campuses with lesser or no participation on research will be in disadvantage because teaching is enriched by research”. Furthermore, a full-time professor forecast that “if a campus keeps from doing research, it will probably lose those professors wanting to engage in the activity; they will migrate to campuses in which research takes place”. In opinion of a top administrator, this phenomenon will also impact the students by attracting them to campuses doing research, which is detrimental to the rest. The resultant picture of this is, in the eyes of an academic administrator, an institution having both first and second class campuses based on their research contributions. He lamented that León campus is being placed in the second class group as a consequence of the faculty layoffs; “the divestment of people that took a great deal of time and other resources to develop has downgraded the campus, which in turn affects the community, too”. In summary, all the disadvantages or undesirable outcomes above listed could be interpreted as both a vote of no confidence for the intended institutional research networks and a vote in favor of the pursuit of research at León campus. That is, most of the people interviewed want their campus to conduct research. The aspiration is highly relevant given the inverse position that León campus’ top administrators have in this respect.

Remarkably, only one interviewee (a full time professor) contemplated the possibility that the institution’s call for research might differently impact not only each campus but the fields within them, also. Specifically, he declared that “because of its lack of applicability, it will be less likely for fields such as the humanities to get external funding

for research. Therefore, institutional funds should be allocated to this field in order to alleviate the situation”.

The disadvantageous situation that disciplines like the humanities, considered unattractive to the market, have to face when market oriented policies for research are implemented in colleges and universities is specifically addressed by Slaughter and Rhoades (2004) as one of the negative consequences of academic capitalism due to its implications for stratification. On the other hand, when it comes to deciding which campuses should conduct research, it seems clear that most people at León do not want their campus to be relegated to what they called a second class category. Their perceptions of the outcomes associated with the research networks being promoted by the institution seem to be the primary reason for their position. Actually, the outcomes they anticipate are conducive to stratification as well.

It was also surprising that only a handful of the interviewees considered the inclusion of the established region's research centers or the local universities, instead of the León campus internal peers, as part of a research network allowing the campus to engage in knowledge creation. Because of the orientation the centers may have, this alternative was judged as beneficial for the local and regional industry.

Despite all the aforementioned implications regarding different levels of campus/field involvement in research as a result of the Tecnológico de Monterrey's research strategy, a few interviewees did not consider them as troublesome. They argued that concentrating research in a few campuses and/or areas is more effective and efficient. They supported the scenario in which campus resources determine its participation in the institution's

research strategy. Nonetheless, others opted to see the campus level of participation in research as simply reflecting the demand and support that the campus in question has from government, industry, and the community in which it operates. To illustrate, while assuring that there is no problem from having different levels of research activity across areas of knowledge, an academic administrator stated that “it [the different levels of research] will depend on our clients’ demands: the industry. There is no problem with this because it signals that we are doing research focused on what is really required. We should not focus research towards the wrong direction”. It is easy to conclude from this declaration that those sponsoring research could effectively reshape higher education institutions such as the Tecnológico de Monterrey with all of its campuses considered.

The state of research at the campus

Coinciding with what top campus administrators had reported, everyone except two people said that research was not taking place at León campus. One of these two interviewees, who in fact is a Ph.D., asserted that he was conducting research and even planning a book to share his findings. He did not identify anyone else engaged in research. On the other hand, the second interviewee referred to some people conducting applied research aimed at helping local industry overcome specific problems. He added that they were receiving from the campus no other consideration than moral support to continue the activity. In this respect, a full time professor explained that:

You get only moral support from the campus when showing interest in research. I am in the ..., a field not too important at either campus or system levels, so not much has been done in this field. I did not get any pay for the few things I have done in the past. Moreover, I took time away from my family in order to complete them. Due to the lack of economic support, I did not present one of my works in an international conference.

Finally, sabbaticals and Ph.D. dissertations were mentioned as intermittent opportunities for people to engage in research. In sum, there are some few isolated efforts at conducting research, regardless of a nonexistent campus strategy to that effect.

A long list of reasons was associated with the absence of research at the campus. Among them, it was argued that “the institution as a whole does not do research because of its genetics. Since its origins, the institution was not conceived as research oriented. Therefore, change is really hard to introduce, even though its current mission endorses research”. Another reason mentioned very often has to do with the fact that León campus is not labeled as research oriented. Actually, this for some explains the low priority for research at the campus. Conversely, high priority has been given to teaching and to extension as a possibility for knowledge transfer. On the other hand, the reality of not being part of a research oriented campus is closely linked with painful memories, too. Specifically, some people vividly recalled that years ago, after asking the institution’s president to provide support for research at León campus, the response was that “they first should learn to crawl before aspiring to fly”. Moreover, the president’s position on the issue does not seem to have changed over the years. An interviewee cited him as recently declaring that “Querétaro, México City, State of México, and Monterrey are the campuses called to be the big players on research”.

Not having face-to-face graduate programs at the campus was also mentioned as a cause for absence of research. In fact, León campus used to offer a face-to-face MBA program but it was canceled because it did not meet the requirements imposed by the Tecnológico de Monterrey and the accreditation agencies in order to offer such a

program. An academic administrator reported that there were no incentives to reopen the program due to the lack of local demand currently perceived for it. Therefore, online programs represent the only option for those interested in graduate education at the campus. However, the dean in charge complained that:

The great majority of the campus' graduate students enrolled at online programs offered by the institution through its virtual university are not longer required to do a thesis for program completion. It amazes people when somebody opts for a thesis instead of doing additional coursework. Perhaps theses began to not be required for market reasons. It is more appealing to the market.

This program reorientation to the market perfectly supports the Slaughter and Rhoades (2004) assertion that people within universities are actors promoting academic capitalism. On the other hand, scarce external support from governmental agencies and the industry coupled with the campus' inability to access them were added to the referred list. In words of an academic administrator, "León's local industry does not demand research. Local businessmen neglected their factories and now they are experiencing lack of competitiveness as a consequence". From this declaration, it seems reasonable to conclude that they are not identifying research as a suitable solution to overcome their difficulties. Finally, some interviewees expressed that the critical financial situation the campus is facing, primarily as a result of its decreasing student population, makes student recruiting one of the highest priorities and research an unaffordable luxury. On top of this, the reduced campus faculty is unable to conduct any research because of their heavy workloads in general and teaching loads in particular along with the lack of a sound physical infrastructure. Referring to the teaching loads, a full time professor wondered:

Why the institution first invested in people to achieve Ph.D.s and then required them to teach five courses per semester? That is expensive and a waste of resources. What

do we want people with Ph.D.s for?...Right after I came back from overseas with my Ph.D. I was told by my boss that “your duties are teaching and forget about everything else”.

Summarizing, apart from a non-research vocation intrinsic to the institution, a combination of external and internal factors was identified as preventing León campus from engaging in research.

Research appropriateness for the campus

Almost all of the people interviewed agreed that sooner or later, León campus must engage in knowledge creation. Conversely, a Ph.D. acting as academic administrator stated that:

León should not do research. We are a very small campus with just a few full-time professors. On the other hand, regional needs can be fulfilled by taking advantage of technologies and knowledge already existent. However, we must also get closer to the community in order to have the opportunity to help....León will not be at disadvantage from not doing research if research findings reached at other campuses are shared across the system and if professors willing to do research can do it along with peers located at other campuses.

Nonetheless, it is noteworthy to underscore that even from this perspective, research is not discarded for individuals within the campus and that research networks and collaborative working have critical importance. Moreover, collaborative research networks are the mechanism considered suitable by some people supporting campus engagement in research. As previously mentioned, a few of them contemplated the inclusion of not only the institution’s campuses but of the other universities and research related organizations for the constitution of the research networks. To illustrate, a full-time professor advocated this possibility by stating that:

We [the institution] must stop thinking that there is nothing beyond us and start considering how can we build research networks with other Mexican institutions.

León city is surrounded by more than 40 research centers. Are we going to take advantage of it?

Those considering research as inappropriate justified their position by stressing that the campus' complicated financial situation and the very limited number of full-time professors make it an unthinkable possibility. Remarkably, it seems that these people discarded research based not on its possible outcomes but rather on the resources needed to afford it. Hence, even those few opposed to having the campus as a whole engaged in research do so not because of research itself but because of its affordability or their specific position on how to best approach it.

Reasons in favor of embracing research ranged from addressing prestige to attractiveness to societal impact. To exemplify, an academic administrator advocating research at his division urged that:

My division must conduct research because of accreditations. In 2000, we started to pursue the AACSB [an American agency] accreditation. However, our lack of research activity made it impossible to achieve. Nowadays, even Mexican accreditation agencies are increasingly asking for research as a part of their criteria. We expect to get the CACECA [a Mexican agency] accreditation this time but there is uncertainty regarding its renewal if our lack of research activity persists. On the other hand, it is an institution's strategy to have accredited all its programs. Seeking accreditations while doing nothing to support research is highly contradictory.

It was mentioned previously in this chapter that the pursuit of program accreditations is part of the institution's research strategy aiming at prestige. Therefore, it is very frustrating to mention nonetheless that heads of academic programs at non-research oriented campuses like León are under the pressure to get their programs accredited when research activity is part of the criteria to meet in order to obtain such accreditation. Nevertheless, program accreditations are not seen as the only way for research to bring in

prestige. In the opinion of some of the interviewees, research itself improves campus prestige, which in turn they see as a powerful mechanism for attracting more students and more prestige consequently, making possible the formation of a virtuous circle. This possibility is very appealing for the people sharing this rationale, given both the decrease in student population the campus has been dealing with and the rise in the number of higher education institutions considered as competitors. Actually, an academic administrator made a case for research by addressing competition. Specifically, he assured that the very existence of the campus was at risk if it keeps from doing research because “its competitors have become very similar but charging less tuition. They are always imitating us, so we need to raise the stakes”. Attracting more students would also allow the campus to reach a healthier financial situation.

The prestige allegedly derived from research was also referred as assuring the campus its entrance to the group of first class campuses within the institution. In addition, some interviewees anticipated greater willingness from the industry to conduct research in response to having a prestigious campus. Expectations towards having performance improvements (i.e. greater competitiveness) were also referred to as important incentives for industry to solicit research from the campus. On the other hand, the community was also identified as the beneficiary of research when this activity is oriented towards the fulfillment of community needs, such as the achievement of higher living standards. That is, by positively impacting society, the campus becomes more relevant in the eyes of the community.

It is very interesting to observe how the León campus wants to resemble other campuses within the Tecnológico de Monterrey because of the prestige it conveys on them. Although there are no indications that DiMaggio and Powell (1983) alluded to non-autonomous organizations when introducing their thesis about institutional isomorphic change, their propositions appear very suitable for understanding what is happening at the institution object of this study. Hence, it is appropriate to posit that mimetic isomorphic change will occur if León campus takes actions aimed at modeling itself after those campuses within the institution it identifies as first class. In the end, gaining external legitimacy is what drives León campus to mimic others. Lastly but not least importantly, efficiency attainment does not appear to play a role in this desire to copy.

Necessary actions to further endorse research

It was already mentioned that no research is currently the campus research strategy and that all except for two of the interviewees confirmed that research was not actually taking place at León campus. Nevertheless, it was also made clear that almost all of the people interviewed agreed that, sooner or later, the campus must engage in knowledge creation. In short, most people at León campus disagree with the no research strategy and want it to be the reverse. It is noteworthy to mention that this aspiration prevails even in those fully aware of the difficult financial situation at the campus. As expected, this awareness was found in all the three academic deans. Indeed, they see the campus engaging in research as a priority as soon as the financial situation subsides; therefore, it is a question of timing. To illustrate, one of them stated that “today, it is inappropriate to

declare León as a research oriented campus. We cannot meet the external expectations derived from such a declaration. Internally, nobody is expecting it due to the campus' finances". Anticipating the impact from the application of the institution's new admission standards, another dean recommended that "León should not conduct research right now but, in two years, once the changes in its student population caused by the new admission standards occur. We better not include the research variable in the already complicated campus financial situation". On the other hand, professors also showed awareness regarding the campus financial situation. To exemplify, while complaining about lack of interest from campus authorities in research, a full-time professor expressed that "they are focused on improving the campus finances".

Most of the people advocating research engagement stressed that the campus top administrators must initiate change towards the intended direction. However, change is very unlikely to happen, even though an academic administrator expressed that "eventually, the local or regional industry might demand research from the campus". The assertion aimed at no change stems from the fact that he did not delineate any strategy favoring research at any time during the interview. Nonetheless, research supporters are waiting for the green light. Moreover, some of them did not consider the campus financial situation as a deterrent to research engagement. Interestingly enough, all the full-time professors interviewed were among this group of supporters and their statements about the issue in question were crystal clear. To exemplify, while arguing that despite the fact that León campus is ready for research, one of them stated "explicit permission to engage in it is the only missing thing". Reinforcing this statement, another

professor affirmed that “nobody here has declared research as a goal...A declaration of interest for research should be made by senior campus administrators. Change must be initiated by them”. Finally, a professor expressed that “research will bring recognition to the campus. However, a clear directive towards research should exist. Otherwise, those like me wanting to do research will crash into the wall”.

In addition to initiating change, research advocates are asking the campus’ top administration to set the tone for research by making what they consider some important clarifications. The request primarily targeted communications addressing what an interviewee called the “how’s, who’s, what’s, why’s, and where’s of research”. To illustrate, some people wondered who will benefit from research as well as how specifically society will be impacted. Some showed particular interest in “clarification about economic benefits resulted from the eventual commercialization of knowledge”. This absence of clarifications along with the lack of endorsement for research is totally understandable given the research strategy the campus has in place.

Going beyond clarifications, a good deal of people demanded from the campus’ top administrators specific changes such as a redefinition of the professor’s role in order to make it compatible with research. Particularly, all of them agreed on the necessity of reducing faculty workload. It is noteworthy to mention that, even though the campus top administrators are not a research advocates; they identified “faculty workload as the biggest challenge for León campus. People are simultaneously playing so many roles that there is no room left for research”. The roles he referred to are mostly of an administrative nature and demand a high amount of time. In fact, four interviewees

explicitly complained about what they called their very heavy workloads. In addition, the campus' requirement of teaching four to five courses makes research unattainable. In words of an academic administrator who also teaches four courses, "we, as an institution, are wasting our intellectual capital. We are using it primarily to achieve administrative efficiency". Underscoring the time demanding nature of research, another academic administrator who also acts as program head and teaches three courses stated that "research demands a lot of time and a high priority in the schedule and we lack both. We have to give up weekends, spare time, and so forth, in order to do some research". Based on knowledge regarding the requirements of peers working at different campuses within the Tecnológico de Monterrey, some people have some clues about what the faculty workload should be. To exemplify, another academic administrator also acting as program head and teaching three courses mentioned that "I have a friend working as a researcher at Monterrey [campus]; however, based on what we both do, it seems that we are working for completely different institutions".

Along with the redefinition of the professor's role, some people also called for changes in the reward systems. In this regard, an academic administrator posited that "our reward system does not propitiate the expected behaviors regarding research. The professor is typically worried by how his work on research and/or extension will negatively affect his or her performance evaluation". To complete the picture, another academic administrator stated that "the institution's performance indicators are mainly focused against on what a higher education institution is suppose to do in terms of knowledge creation and knowledge application for the social benefit".

Appropriate organizational structures for the achievement of research were among the things that some interviewees additionally demanded. Comments primarily centered on the rigidity prevalent in the campus' current administrative systems. Suggestions called for systems allowing professors to overcome internal bureaucracies as well as facilitating partnerships with industry, promoting greater closeness and collaboration with external research centers, and taking advantage of business opportunities. Contrasting internal practices with alleged faculty readiness for research, an academic administrator stated that "the institution is ready in the sense that every campus has at least one people trained to conduct research. However, the organizational processes to manage research-related activities are not ready". Also underscoring inadequacies, another academic administrator assured that "we [the institution] have a great mission along with administrative structures with a very poor capacity to react....The fact that research is included in our mission does not assure that it will become reality". It is fair to say that some people often referred to Monterrey, Estado de México, and Ciudad de México as campuses within the institution already operating under organizational structures favoring research.

Institutional funding was the last major item demanded from the institution in order to promote research. Sharing his thoughts, a full-time professor voiced: "I have the impression that campus authorities see research as expensive and without payoff. We should bet on research". Underscoring the institution's lack of good reputation for research, another full-time professor urged that "the institution must invest resources in research. Otherwise, it is difficult to get funding because we do not have the prestige that others do regarding research. What is the substitute for research if we resign to it?" On

the other hand, it is noteworthy to mention that contrary to what was said regarding industry, only two interviewees considered the government as a source for research funding.

A few people came to the realization that today the campus may not have enough human resources either available or willing to engage in research. In their opinion, the fact could represent a real impediment for the implementation of a strategy in favor of research. To illustrate, an academic administrator stated that:

In the past, the campus implemented a strategy to help faculty to get their Ph.D. and the strategy paid off. Alas, many of these people are not longer on the campus, so in order to place research as a goal we need first to do a census to determine how many people are trained to conduct research and how many of them are interested in conducting research.

It is not surprising that, in congruence with the above statement, some people recommended hiring faculty trained in research prior to the implementation of any research strategy.

Finally, it is noticeable that the organizational inadequacies identified at León campus as deterrents to research greatly coincided with those mentioned at the institution's system level. However, the coincidence could mean nothing else than that. Given the León campus' size, its non-research category, its no research strategy, its complicated financial situation, and the institution's requirement of self-sufficiency regarding research, the disappearance of these inadequacies seems very unlikely.

The institution's Querétaro campus

The rationale for research

In general, arguments utilized by interviewees at Querétaro campus regarding the rationales behind the Tecnológico de Monterrey's commitment to research, showed no important deviations from those utilized by the people both at the institution's system level and at León campus. A third of the interviewees identified the country's development as the driving force behind the institution's research strategy. Moreover, a couple of them pointed out that it is the institution's responsibility to initiate change towards the country's development. Nonetheless, the country's development clearly had different connotations among several people. For some, it meant higher living standards within the population, whereas for others it translated into a lesser technological dependency upon other countries. On the other hand, it was also mentioned that through research contributions towards Mexico's development the institution would transcend the point where its teaching activities have placed it so far. In words of an interviewee, "research will fulfill the institution's necessity for reinforcing its presence in society".

Similar to what was expressed at León campus, congruence was included among the motivators for research. For a top administrator, "we [the institution] must do research in order to eliminate the gap between what we say we are and what we really are". By the same token, another interviewee stated that "research will improve the institution's congruence with the vanguard position that it declares to have". In addition, a good deal of people at Querétaro campus believes that research is essential for any higher education institution aspiring to be considered as a university. Interestingly enough, six of the eight

people making that point hold Ph.D. degrees. To illustrate, one of them expressed: “I am convinced that a university must create knowledge. For many years, we as an institution have been only spectators regarding research”. Statements like “universities are incomplete if research is missing” and “without research we are not a university”, showed the association they posit exists between research and universities. Hence, from this perspective, the feeling of incompleteness held by some interviewees regarding the absence of research is completely understandable. In fact, one of them argued that “nobody doubts the institution’s teaching capabilities. However, research would take us to becoming a complete university”; “to become a university instead of a college” in words of another interviewee.

Along with providing higher education institutions the possibility to become a university, it seems that research also paves the way to prestige and the rankings developed around it. Indeed, responses from two-thirds of the interviewees addressed the proposition as a fact. Noticeably, prestige and rankings were often situated in an international context. To exemplify, it was mentioned that “the institution is interested in research to be better ranked and to earn prestige internationally”. Specifically, a top campus administrator stated that the institution is pursuing research “because it came to the realization that prestigious universities worldwide do so”. By the same token, an academic administrator posited that “research is a Tecnológico de Monterrey strategy to be recognized internationally”. In words of another academic administrator, creation of knowledge rather than just its transfer provides the institution entrance to the ‘big leagues’. On the other hand, it is noteworthy to mention that interviewees’ responses also

conceded that research would take the Tecnológico de Monterrey to resemble other institutions. In opinion of an academic administrator, “through research, the institution would be comparable to UNAM or Politécnico [the first and second largest public Mexican universities respectively] regarding research”. Claiming that some foreign institutions are also a target group for the institution’s aspirations, another academic administrator stated that “the Tecnológico de Monterrey is pursuing research because it wants to be like Harvard and the MIT”. Finally, reinforcing this international reference point, an academic administrator assured that “the institution is pursuing research because it aspires to be a world class university”, whatever this means.

Similar to what occurred at León campus, some people at Querétaro campus considered that research engagement could be simply an institution’s response to changes in the environment in which it operates. In this regard, being increasingly considered similar to other higher education institutions in the eyes of the college-aged population was presented as one of the most significant changes with which the institution has ever dealt. For a full-time professor, the phenomenon explains why “some applicants are enrolling with our competitors”. Consequently, as an academic administrator stated, “the institution is choosing knowledge creation rather than knowledge transmission as a way of differentiation from its competitors, [which are other Mexican private universities charging moderate to high tuition fees]. They seem to have reached the previous standards set by the institution”. In opinion of another academic administrator, this approach “will allow the institution to become more appealing to those students interested in research”. However, an administrator pointed out that graduate rather than

undergraduate students are the ones interested in research. Therefore, for the latter, “research will not differentiate the institution from its competitors”. Conversely, other interviewees mentioned that research does make a difference by rising undergraduate academic quality. They were positive that research would improve the professors’ reputation to students as well as keep them from stagnation and departure from the institution. Moreover, some people agreed on the premise that the professors’ demands rather than competition have driven the institution to commit to research. Indeed, a campus top administrator stated that “the institution is pursuing research in response to its Ph.D. professors’ demands in that regard”. In addition, underscoring the necessity of retaining professors holding Ph.D.s, an academic administrator assured that “some colleagues with Ph.D.s have left the institution because of its lack of research”.

Accreditation agencies, whether national or international, were referred as playing a decisive role in the Tecnológico de Monterrey’ research strategy. Accreditations were defined as compulsory for those seeking recognition and differentiation. Therefore, the institution is willing to engage in research since the activity is often an important part of the criteria utilized by those granting the apparently invaluable accreditations. On the other hand, institution willingness to conduct research was also associated with a desire to be close to the private sector, which somehow is seen as a way of gaining both legitimacy and prestige.

The wide similarity observed between the responses gathered from the León and Querétaro campuses with respect to the reasons behind the Tecnológico de Monterrey’s orientation to research validates concluding the same for both cases regarding

institutional isomorphism. That is, coercive, mimetic, and normative mechanisms are acting in the institution and steering it to become more similar to those higher education institutions perceived as successful, prestigious or legitimate before society. Moreover, contrary to what was externalized at León campus, some Querétaro interviewees explicitly mentioned that accreditation agencies are forcing the Tecnológico de Monterrey to conduct research. The assertion clearly exemplifies the coercive isomorphism that DiMaggio and Powell (1983) present as resulting from the imposition of standards by organizations upon which another one depends.

Finally, one of the interviewees identified the profit motive behind the institution's interest in research. He specifically said that:

The Tecnológico de Monterrey is pursuing research because its top administrators realized that research could be profitable when discoveries are subject to commercialization. I am convinced that research can be profitable if we focus on developing technology to substitute manufacturing machinery and equipment the country is currently importing.

A case for academic capitalism could be derived from this declaration, assuming it unveils the rationale behind the Tecnológico de Monterrey orientation towards research. Therefore, it could be stated that the institution's research strategy is simply the selected alternative to insert the institution into the knowledge economy with the expectation that it will bring in revenue streams. Moreover, it is worthy to keep in mind that economic benefits attributable to research, applied sponsored research to be specific, were also addressed at León campus as well as at the institution's system level.

The campus research strategy

Contrary to the León campus' case, Querétaro campus is considered by the Tecnológico de Monterrey as a research oriented campus. That is, Querétaro campus is expected to do research. However, given that the pursuit of research is not banned for any campus, what apparently makes the difference between them is not their category within the institution (i.e., whether or not a campus is research oriented) but the affordability of research for them individually. In short, regardless of its research orientation, a campus will engage in research whenever it can afford it. This statement seems to be true at least in the case of the campuses addressed in this study. That is, the León campus' complicated financial situation appeared to be the decisive factor for those against the pursuit of research there as well as for those in favor of delaying the pursuit once the campus overcomes that situation. On the contrary, no mention whatsoever regarding financial distress was made at Querétaro campus. Moreover, some interviewees took pride in the student population growth that the campus has experienced during recent years. According to the institution's official statistics regarding undergraduate and graduate student population academic periods, Querétaro campus grew 7.4% between the 2004 and 2006 fall, whereas León campus decreased 13.6%. When is taken into consideration that Querétaro campus' student body is 3.5 times that of León, the resultant picture better explains why these two campuses are approaching research in such different ways.

From all the above, it is fair to presume that research encounters in Querétaro campus favorable conditions for its development. A strategy aimed at research as well as the

campus top administration acting as the driving force behind it could also be presumed.

The findings of this study partially support these presumptions. Specifically, a top campus administrator said that:

Three years ago, research lines were defined and promoted within the campus as a way of encouraging collaborative research among those already working on it but in an isolated fashion. Nowadays, the campus sponsors two endowed chairs, one in architecture and the other in manufacturing. Additionally, the establishment of two research centers, one in biotechnology in combination with the University of Wisconsin at Madison and the other in aeronautics are under consideration.

As a way of promoting collaborative research, the campus is adopting an approach that could be seen as not completely aligned with the institution's strategy aimed at collaboration circumscribed within the institution's boundaries. Aware of this, a top campus administrator stated that:

Querétaro [campus] has always been seen as rebel....The campus is giving its professors freedom to join any research center either inside or outside the campus in order for them to do research. Actually, we already have formed some alliances with research centers located in the surroundings.

In addition, the campus has brought back to life the institutional scheme delineating the paths that any Tecnológico de Monterrey professor should follow in order to be classified as primarily devoted either to teaching, research, or consultancy. Since its inception in 1990, the scheme was not implemented in Querétaro campus until nine months ago when its president officially validated it. Moreover, it was reported that along with economic benefits associated with advancement within the classification system, Querétaro campus' professors holding membership to the SNI also receive a salary increase during the time they maintain that status. It is pertinent to mention that the SNI was created in

1984 by the Mexican federal government aiming to both strengthen and stimulate research efficiency and quality.

Remarkably, two opposite realities regarding the campus research strategy described by a top administrator were voiced by the rest of the interviewees. Interestingly enough, each of the conflicting versions is clearly associated with one of the two existent academic divisions in the campus. Those working in the Division of Engineering and Architecture (DIA) agreed with the referred administrator on the existence of a research strategy favoring research and even pointed out some of its peculiarities. To illustrate, the DIA's dean assured that "on August 2005 the researcher path was officially opened".

Underscoring the resource allocation to research, he added that:

Currently, Querétaro along with Estado de México, Toluca, and Ciudad de México campuses devote 1.8% of their operational budget to research. Campus estimations determined that with the 1.8%, about 12 to 13 professors could be supported with research assistants and some other research-related costs. Fortunately, no professors willing to engage in research are being left without support so far.

It is important to mention that the first three campuses just listed are considered research oriented and constitute the institution's Central Zone. This may create synergy for the benefit of research. Indeed, an academic administrator mentioned that two new research centers have been recently established as a result of the combined participation of the three campuses. Nonetheless, he also recognized that "no scheme for research collaboration has been defined at these centers yet".

In reference to the interinstitutional collaboration contemplated as part of the research strategy delineated by a top campus administrator, an academic administrator praised the campus for "allowing us [the faculty] to advise Ph.D. students from other institutions".

He is thankful for having that possibility, “given that the campus does not offer Ph.D. programs and high level research is conducted at that level rather than at the Master’s level”. Addressing other characteristics of the collaboration scheme, an academic administrator stressed that “it comprises faculty exchange, sabbaticals, teaching, use of equipment and publishing among others”.

Based on what some interviewees mentioned, support for face-to-face Master’s programs plays an important role in the campus research strategy. Indeed, the two programs offered by the DIA host the two endowed chairs sponsored by the campus. In words of a full-time professor, “research would cease in my department if we would not have the Master’s program”. Accordingly, writing a thesis is compulsory for students enrolled in these DIA programs. In addition, it is intended to have these programs accredited and categorized as excellent by CONACYT. Since this agency includes membership to the SNI as part of its accreditation criteria, the referred goal also pushes professors associated with the programs to pursue the SNI membership. Moreover, according to an academic administrator, the campus is requiring all of its professors engaged or interested in research to obtain the SNI membership, regardless of their expertise. Compliance with the requirement will further reinforce research, given that being active in research is part of the criteria everybody has to meet in order to obtain the SNI membership.

In addition to confirming the existence of a campus strategy aimed at research, statements made by DIA’s people allow the conclusion that the strategy is producing good results. To exemplify, an academic administrator stated that:

Some people in my department are doing research mainly because the campus is supporting research since last semester through relieving professors from some teaching responsibilities, establishing endowed chairs and authorizing some research assistants, which receive a full scholarship and a stipend. Before this, we were told that research had to be done during our free time.

By the same token, a full-time professor admitted a different campus approach towards research by declaring that “there are changes; research is currently part of the official discourse at Querétaro ranging from heads of department to academic deans to the campus president. Moreover, they are encouraging me to join research”. He also added that:

Research at Querétaro just started a year ago. Our campus president officially announced before the entire campus community that the research path for professors had been open. Some changes targeting teaching loads have been introduced, so professors can now follow the research path. Currently, the door is open to those willing to engage in research.

Finally, the DIA recently established an entity aiming to offer its professors a paved road towards research. Based on the interview held with its head, the entity: (a) provides professors with information and helps them regarding the SNI application process; (b) helps professors to deal with campus’ administrative procedures; (c) provides information regarding external funding sources for research; (d) helps in recruiting research assistants (RA’s) and manages some job-related issues with them; (e) is responsible for developing collaborative agreements with other organizations or campuses within the system; and (f) participates in the strategy to coordinate the zone’s campuses research efforts on the automobile industry. Furthermore, the entity allegedly has a website containing all the pertinent information to facilitate professors’ incursion in research. Reactions from the unit’s target users regarding this initiative could be considered promising. To illustrate,

an academic administrator interpreted the unit establishment as “an act of congruence with the official discourse regarding research”.

The other side of the coin is that, except for its dean, all the interviewees working at the Division of Administration and Social Sciences (DACs) (the other campus’ academic division) denied the existence of a campus research strategy promoting knowledge creation. In words of an academic administrator:

This campus [Querétaro] does not have hitherto a research orientation; its focus is on teaching. Yet there is some interest in research, we lack the time to engage in the activity. We have the infrastructure necessary to conduct research. However, the campus needs to decide whether research is going to be its focus.

By the same token, another academic administrator urged the campus president to “declare direction for research” as well as to “define rules and devote resources” to it. Additionally, he stated that “the institution is overworking its professors by asking them to teach five courses and to give support to many administrative activities. Hence, it becomes impossible for them to do any research”. This statement clearly signals unawareness that the campus allegedly has in place a policy aimed at relieving professors involved in research from some teaching burden and allocating financial resources in support of the activity.

DACS’ full-time professors seemed to be on the same page with their bosses, the department heads, regarding research. To exemplify, one of them stated that “campus authorities must determine whether we will engage in [research]”. Furthermore, he declared that he is “waiting for a discussion involving authorities to determine a sound strategy for it”, in case the decision turns in favor of research. The second professor interviewed explained that he arrived to the conclusion that no strategy aimed at research

was in place at Querétaro after realizing that his division has neither research centers nor professors engaged in research. Unsurprisingly, none of these two had perceived any organizational change in support of research.

As previously mentioned, the DACS' dean recognized that Querétaro campus has a strategy for the promotion of research. Actually, he acknowledged that some of his professors had already benefited from one of its mechanisms. Specifically, he related the case of two professors from the humanities who were allowed to conduct joint research with a team of researchers located at other campus. The research, including the costs associated with the professors' participation, was funded by the other campus through an endowed chair. Alas, their participation ceased after they were asked by their academic department head to withdraw from the team, regardless of their outstanding performance. The petition found justification in two things: the alleged disinterest demonstrated by these professors in their own academic department projects along with the zero impact on Querétaro campus' students that their research was having. It was argued by their colleagues that such outcomes developed from their commitment to projects were not in the department's best interests. The dean ended his recounting by adding that both professors no longer work for the Querétaro campus. In this respect, departure from the institution like these two professors and those reported at León campus could be considered as a corollary for those daring to become trailblazers.

Despite the fact that his division is not hosting any endowed chair, a DACS academic administrator recognized that the two endowed chairs sponsored by the campus and hosted by the DIA "have been a good intent with fair results regarding changes on

organizational structures in support of research”. In addition, despite being aware of the evident connection between endowed chairs and face-to-face Master’s programs at Querétaro campus, he revealed no plans to establish an endowed chair linked to the MBA program offered by his division. Moreover, he emphatically stated that “we must not pursue research at our MBA program. It was not designed for that purposes. Our students are part-timers and do not enroll having research in mind”. Showing a similar position on the issue, an MBA’s administrator posited that “this is not the place for doing science without application in the places where our students are working....We are not interested in having our students theorizing; that is the professor’s role....Students do not do research”. From his perspective, the program requires “professors having experience from the ‘real world’ (i.e., creating businesses) as a way of legitimization to students”. Nevertheless, another DACS administrator shared the intention of starting a Master’s program in Managerial Sciences with full-time students. He envisions research within the program and aims for a good position in the rankings. Finally, the knowledge that the DACS’ dean demonstrated about the campus research strategy in place also included the reopening of the professor’s research path.

From all the above, it results very curious that nobody in the DACS but its dean knows about the existence of a campus’ strategy supporting research. Why is that academic administrators are demanding the campus president to declare direction for research and to define rules and devote resources for that purpose? Why are professors asking campus authorities to determine whether the campus will engage in research or conclude that no research strategy aimed at research was in place at Querétaro? Why

people at the DIA seem to be experiencing a very different reality, despite belonging to the same campus? A compelling argument to make sense of this could be found in the personal position that the dean has towards research as well as in the corresponding position of the campus president. Specifically, he stated that “I am requesting my boss to not ask me to give research the highest priority because I have a lot of things to do before”. Hence, it is likely that somehow the campus president had already granted him what he is asking for. If this is the case, still unknown are the duration of this concession and the consequences derived from having the DACS practically disengaged from the campus research strategy.

Type of research

As observed at León campus, none of the interviewees at Querétaro campus opposed the institution’s commitment to research. With respect to the type of research desirable, applied research was always included in the interviewee responses. However, one-third of them added basic research to their stand. All except one of the full-time professors were among those assuming that position. Unsurprisingly and coinciding with that observed at León campus, neither the campus president nor its deans visualized the institution pursuing basic research at least in the next decade and only under the presumption that enough financial resources would become available.

A great variety of justifications were presented in favor of applied research. To illustrate, a very practical reason for its pursuit was offered by an academic administrator when he stated that “we [the institution] do not have any chance to catch up with the countries currently doing basic research”. Instead, he and other academic administrator

recommended taking advantage of all discoveries resulting from basic research by doing technology development aimed at the problems begging for solutions in Mexico. A good deal of justifications focused on resource availability, often considering it a decisive factor. Accordingly, an academic administrator stated that because of the huge amounts of resources involved in it, “basic research is an unaffordable luxury”. To make things worse, another academic administrator stressed that “we [the institution] are in great disadvantage with UNAM or Politécnico when competing for public monies to conduct basic research”. On the contrary, a perceived greater availability of external resources from the industry to fund applied research coupled with the allegedly institution’s vocation towards practical, applied issues related to the industry led some others to favor this type of research. Furthermore, a professor expressed that “applied research is embedded in the institution’s foundations”. Completing the picture, another professor made sense of applied research by pointing at its marketability.

Societal and national benefits were also strong arguments utilized by people in favor of applied research. Specifically, it was argued that applied research has a greater and more immediate positive impact in society. Moreover, some people were even convinced that it is easier to achieve. In the eyes of some interviewees, its association with an application makes this type of research the most suitable when it comes to addressing specific problems challenging the country, the regions where the institution has its campuses located, and/or the industry. In the words of a professor, the institution must focus first on applied research “to help our country face its challenges”. Interestingly enough, references to the industry rivaled society and the country regarding the target and

justification for applied research. That is, there is strong agreement that helping the industry to overcome its problems justifies the pursuit of applied research by the institution.

Many of the arguments just presented in favor of applied research widely coincide with the basic science for use paradigm that Slaughter and Rhoades (2004) refer to as conducive to academic capitalism. Statements pointing out that applied research is the right approach due to either its marketability, the availability of funding from the industry, its greater and more immediate impact in society, its capability to help industry overcome its challenges, or its affinity with the Tecnológico de Monterrey's nature all set the stage for academic capitalism to develop and for securing revenue streams from the market.

Despite the consensus about the appropriateness of applied research, two words of caution were voiced regarding some of its implications. After declaring himself convinced that applied research is the institution's vocation, an academic administrator added that "findings from applied research are more difficult to get published as research papers due to confidentiality requests from those sponsoring research". In fact, Slaughter and Rhoades (2004) fully back this possibility while presenting it as one important characteristic of the academic capitalist regime. On the other hand, a professor made her case for applied research aimed at industry stressing that it matches with the Tecnológico de Monterrey tendency to seek short term results and rapid investment returns. However, she also mentioned that "applied research could keep the institution from strengthening its presence in society".

Finally, those interviewees who considered the pursuit of basic research in combination with applied research as appropriate for the institution often visualized it as being reached after the institution has a good grasp of applied research and the resources it demands. Actually, some people identified applied research as the resource provider for basic research. In addition, society and the country's needs were always mentioned as the reasons for basic research to exist. On the other hand, the two-thirds who considered the pursuit of basic research as undesirable justified their position by arguing its nature to demand high resources as well as its inappropriateness for approaching the country's challenges.

Focus of research

As observed at León campus, interviewees' responses addressing focus of research pointed at both the system and the campus levels. However, contrary to what happened there, most interviewees at Querétaro campus did specify areas on which to focus their campus. Possibly because of current campus engagement in research, only a few of the responses were aimed at the system level. In this respect, under the argument that the institution is unable to master and afford all, it was made clear that it must focus its research only on a few areas, specially those targeting problems affecting the different regions where its campuses are located. On the other hand, a couple of interviewees stated that research pursued by the Tecnológico de Monterrey should be focused primarily on engineering and business fields rather than on the social sciences as a way of reflecting both the academic programs and the student population composition of the institution. In the words of a professor, "research must be conducted on those areas where

the institution is offering academic programs, yet focusing primarily on those areas/programs having more students, income, or resources”. By the same token, an academic administrator proposed that “despite some areas might be neglected, research should focus on a very few. U.S. universities do this. It increases the campuses’ chances to be at the forefront”. For better or worse, this approach would help to maintain the internal status quo to which the interviewees referred.

Responses aimed at the campus’ focus of research varied widely. It is fair to say that the responses reflected, at least partially, interviewees’ awareness regarding the campus research strategy. To exemplify, statements like “at Querétaro campus, all areas have opportunities to do research. However, the campus strategy will define who is going to participate”, “the campus must define a few areas to focus its research on”, “the campus needs to state whether research is going to be its focus”, or “the campus president must declare direction for research”, signaled little awareness, if any, of the campus research strategy. Unsurprisingly, these statements were made almost entirely by DACS’ people. Another group of people stressed the importance of having campus research focused on the needs of its surrounding community. Interestingly enough, some interviewees, all from the DIA, equated community needs with industry needs, calling to subordinate research accordingly. Moreover, an academic administrator stated that “Querétaro [campus] must do research only on areas where external funds become available because research must be self-sufficient”. On the other hand, another academic administrator underscored the necessity for the campus to focus its research on issues appealing to society. Moreover, arguing greater chances to positively impact society, he recommended

the campus to avoid the pursuit of research either in communications or in architecture despite being aware that “compliance with this might result in having first and second class programs within the same campus”.

The people more apparently knowledgeable about the campus research focus strategy openly expressed either their agreement or disagreement with it. To exemplify, a professor said: “I agree with the focus that the campus determined for research, which is reflected in the two campus endowed chairs”. It must be mentioned that this professor is associated with one these chairs. Nonetheless, according to what some top administrators declared, a shift in the focus is very likely to happen if the adoption of biotechnology and aeronautics as the new areas to focus on materializes. Remarkably, the new areas in consideration were proposed by the institution’s regional and system presidents respectively. Moreover, based on some of the interviewees’ comments, the shift in focus seems to be underway and not everyone is happy with the fact. In this respect, an academic administrator stated:

We need clear rules for research participation and to stop changing the focus of campus priorities. Three years ago, architecture was defined as a campus priority but now is not. We do not understand why this is happening, especially after having surpassed our goals related to gaining prestige and publishing. Now we are worried about being asked to stop our research activities.

Apparently, the above worries are not unfounded since an academic administrator of the division hosting the architecture program declared that “the campus will surely support new professors asking to join the research effort. However, their research must be focused on biotechnology or aeronautics, the two research lines recently declared as campus priorities”. When specifically asked about the fate of research on the architecture

program, he added: “There are no plans to cancel ongoing research on architecture. Nonetheless, it will be difficult to support additional professors doing research there”. On the other hand, the road for biotechnology and aeronautics seem to not yet be paved, despite having the official support from some top authorities within the institution both at system and at campus levels. Some interviewees explained that agrofood is the intended biotechnology research concentration; further, they added that the existence of agriculture and food processing academic programs on campus, along with the fact that many food-related plants operate in the Querétaro surroundings, greatly influenced the approach. Nonetheless, an academic administrator made clear that “we [the campus] have never consistently done research on biotechnology”.

With respect to aeronautics, it was mentioned that the area was chosen in support of the state’s and city’s strategy to develop the aeronautical industry in Querétaro state. A recent announcement that Canadian airplane maker Bombardier will begin operations there signals the strategy is starting to pay off. Nevertheless, it is highly questioned by some people at the Querétaro campus if it will translate into a window of opportunity for research, especially when it is still uncertain which type of activities the refereed company will pursue. Showing his skepticism on the issue, an academic administrator stated that:

For many years, Querétaro city has developed a vocation towards manufacturing, not aeronautics. Hence, at least Bombardier comes to assemble, which is closely related to manufacturing, something we [the campus] have experience in, we do not have any chances to succeed there. We do not know anything of aeronautics.

In order to better contextualize the above statement, it would be helpful to not lose sight of the fact that Querétaro campus is currently sponsoring an endowed chair in

manufacturing, linked to a face-to-face Master's program also in manufacturing.

Therefore, it is fair to say that the fate of this program may be like the one in architecture, along with their respective endowed chairs, it too is in suspense.

Lastly, interviewees' responses also unveiled the possibility of disagreement among the faculty with research lines being either pursued or proposed to pursue. To exemplify, an academic administrator called for research in the humanities, arguing that the campus already has everything needed to engage in it. By the same token, another academic administrator urged the campus to open more research lines. To him, matching research lines with professors' interests is crucial for research to succeed. He spent a good deal of time relating how campus authorities did not support a research line proposed by a professor and his department colleagues, arguing that it failed to meet the self-sufficiency criterion and that it would not exploit the campus strengths allegedly related to the region's industrial activity. His disenchanted comments seemed to derive from the fact that it took them a year to reach an agreement on the referred research line and that their recommendation responded to a campus-wide call for proposals for research focus. It would be interesting to see what results from applying the same criteria to the two new research lines the campus is now considering. Nevertheless, it seems that whatever the research lines are finally focused campus authorities are determined to concentrate resources to support them. A clear message in this regard came from an academic administrator when stating that:

We have to keep a close eye on the type of research our professors are engaged in because we can end up having as many research lines as professors. Eventually, we will say to somebody asking for support in a non-strategic research project "let's find out how can we support your project", whereas our message to somebody handling a

strategic research project would be “what else do you need? You are in the right path”.

Derived from this, he recognized the possibility of dissatisfaction with this policy among professors; however he also added that “projects aligned with campus strategic priorities must be supported first”.

It is evident that the majority of opinions coming from the DIA’s people constitute a fertile environment for academic capitalism development. In this respect, special attention deserves to recognize the change on campus priorities regarding the focus of its research. The inclusion of biotechnology is an unmistakable sign of the campus eagerness for connectivity to the knowledge economy. Apart from the chance to succeed in the biotechnology endeavor, the decrease in institutional support for areas once considered priorities is in consonance with what Slaughter and Rhoades (2004) anticipate for disciplines having different commercial potential: restratification.

It is noticeable that changing priorities for research at Querétaro campus have already triggered a shift on the allocation of resources in favor of those units aligned with current priorities. Based on Hackman’s (1985) theory of resource allocation, units focused either on biotechnology or aeronautics are now central to the campus research mission as opposed to the rest, which are consequently considered peripheral. As central units, biotechnology and aeronautics are now invested with power to the degree that the campus depends on them for reaching its research goals. In addition, these units will also gain power to the degree they can bring in outside resources critical to fulfilling the Querétaro campus research goals (i.e. obtaining external research funding or being successful in the commercialization of discoveries). As a corollary, the relevance of having power resides

in the correspondence between it and the allocation of resources; the greater the power of a unit, the greater the amount of resources allocated to that unit. This fully explains what is now happening with architecture and will happen to all those areas that Querétaro campus considered non-central to the campus research goals.

Who are called to do research?

When it came time to evaluate inclusiveness of the institution's mission regarding research, interviewee responses tended to be different depending on the academic division with which each interviewee was affiliated. Accordingly, yet using different argumentations, people from the DIA concurred that not all campuses are called to do research. Specifically, some people stated that regardless of the institution's mission it does not explicitly reserve research for only a few campuses; in practice, it is. To exemplify, an academic administrator stated that "by definition, all campuses are called [to do research]. However, based on capacities, interests, and so on, not all should do research".

Campus financial conditions were particularly mentioned as *de facto* impediments to research either at campus, discipline, or both levels. Therefore, to a certain degree, research is a matter of affordability as was previously mentioned by people at León campus. Another important hurdle to overcome in the financial arena is the self-sufficiency criterion imposed on research by the institution. According to a professor, this "may cancel the possibilities of engagement in research for those unable to obtain external funding. Fortunately, I like to do applied research, but my colleagues interested in basic research are in serious trouble due to this criterion". Once again, this situation

illustrates one of the consequences of engaging in academic capitalism: Those working on research with commercial possibilities will benefit the most.

An uneven distribution of people trained to conduct research (i.e., Ph.D.'s) across campuses was also identified as a hindrance to research. In this respect, an academic administrator pointed out that "the amount of people having SNI membership is highly unbalanced favoring Monterrey and Estado de México campuses". It is important to mention that holding a Ph.D. is among the requisites for obtaining SNI membership. Furthermore, a lack of Ph.D.s among faculty was identified as also having important implications for program accreditation processes. That is, the fewer Ph.D.'s there are in a program, the lower the possibilities for that program to be accredited and for research to be pursued.

Most people from the DIA declared that the institution's mission implicitly calls only a few campuses to engage in knowledge creation and that the official internal discourse explicitly reinforces the message. To illustrate, an academic administrator assured that "the official discourse points out that all small and most medium sized campuses are not research-oriented but teaching-oriented". Also citing the official discourse, another academic administrator assured that "it has been stated that only large campuses like Monterrey, Estado de México, Ciudad de México, Guadalajara, and Querétaro are expected to do research. Neither teaching nor provider campuses are supposed to do research". By the same token, another academic administrator stated that:

Not all campuses are supposed to do research. We all know that there are first and second division campuses. I applaud the official declaration that only campuses like Monterrey, Estado de México, Ciudad de México, Guadalajara, Toluca, and Querétaro having the largest student bodies are expected to do research. The

declaration is a good strategy because it does not create false expectations on small campuses regarding their participation in research.

Noticeably, people widely agreed when asked to list the campuses supposed to engage in research and always included Querétaro in the list. They were also supportive of the scenario in which research is reserved for the few. Based on the framework that the Hackman's (1985) theory of resource allocation provides, it could be argued that the concentration of resources, such as professors with Ph.D.s, students, and face-to-face graduate programs critical for achieving the institution's research goals on the campuses above, greatly explains the allocation of resources across the Tecnológico de Monterrey's campuses. The institution's dependence on these campuses in regard to research invests them with power and consequently with resources. They are central to the research mission.

Reserving research for just a few campuses is for a top campus administrator, "the only possibility to positioning the institution as a real university". Another campus administrator even argued that having all the campuses engaged in research would not be desirable because those lacking resources would be at a great disadvantage and at risk of disappearing. He explained how "U.S. multicampus universities have both research-oriented and non-research-oriented campuses. Therefore, we must decide what we want to pursue: research prestige for all or just for a few". The inequalities associated with this approach were not worrisome for most campus interviewees. Nonetheless, their position was linked to the assumption that knowledge should be shared across all campuses, no matter where it was generated. Moreover, collaboration and research networks along with sharing were frequently mentioned as appropriate mechanisms to utilize by professors

from any campus willing to participate in research. According to an academic administrator, “it would not be any problem from campuses not doing research if their professors have opportunities to collaborate with colleagues from other campuses”. A professor posited that “networks of collaboration must be established as a way of involving small campuses in research without bearing the entire financial burden implied”. On the other hand, challenges associated with collaborative work were also addressed. In this respect, a top campus administrator seemed to be fully aware about the implications. Specifically, she stated that:

The institution can not bear the economic burden that would result from doing research at all campuses. We need to look for schemes that allow us to work collaboratively, instead. Alas, our current organizational structure does not favor this....Our performance indicators system encourages the opposite.

A considerable number of people from the DIA agreed that collaboration is seldom seen within the institution. Moreover, an academic administrator assured that “collaborative work is even less frequent between campuses belonging to different regions”. He added that affinity between research lines is what makes it more convenient for people at Querétaro campus to work collaboratively with research centers outside the institution, primarily surrounding Querétaro city rather than with those located at other campuses of the Tecnológico de Monterrey. Remarkably, another interviewee assured that laboratory use fees charged to Querétaro campus by other institution’s campuses encouraged them to seek collaboration with outside entities allowing them to use their facilities free of charge. In what seems to be an effort to alter this situation, an academic administrator related that it has been recently declared by the Central Zone’s campus presidents that “from now on, institutional funding support will be directed only to

projects involving professors from more than one campus”. In reference to this declaration, the administrator stated that “we do not know how this policy could be implemented. Querétaro [campus] already allows its professors to work with colleagues from outside the institution and we are planning to keep on doing it”. Therefore, it appears obvious that this policy will face resistance.

The Tecnológico de Monterrey has presumably set a policy regarding assignment of research lines also aimed at promoting collaboration between campuses. Under this policy, a campus becomes leader of the research line(s) assigned to it, encouraging people from other campuses to join the research efforts. Nonetheless, an academic administrator considered the policy as inappropriate. In his opinion, the campus not leading a research line refuses to financially support the collaborating professors, arguing that no benefit to the campus results (an example of this was presented earlier). On top of this, he argued that the policy is even unfair when “applied research being conducted at one particular campus could solve problems affecting not only that campus but others, too”. It is evident that, whatever the reason, his position does not consider the transfer of research findings across campuses.

It is noteworthy to mention that some people from the DIA identified as very likely the scenario in which different levels of research develop within campuses, too. To exemplify, a professor stated that “fields doing research with immediate application in the industry are privileged and this is a problem that translates into unequal opportunities for professors. Consequently, they could become frustrated, perhaps with feelings of emptiness because research enrich and complements teaching”. Within the context of

academic capitalism, this statement is helpful to illustrate one of the immediate consequences developed from the regime. However, the ultimate consequence of academic capitalism is the restratification of fields and disciplines by enabling systematic inequalities in the distribution of resources among them. On the other hand, when the possibility of having different levels of research within the same discipline across campuses was recognized, an academic administrator promptly argued that “affected professors could move to another campus or work with colleagues from other campuses or even other institutions. The challenge would be to convince students that there are not first and second class programs but star and good programs”. Nonetheless, for other academic administrator, having first and second class campuses and programs is inescapable.

Lastly, as it was mentioned at the beginning of this section, most people from the DACS externalized that the institution’s mission is inclusive of all campuses with respect to research. In the words of an academic administrator, “the door is open to everybody”. Nonetheless, they somehow coincided with responses from the DIA when recognizing that research engagement would be challenging for small campuses and that the activity would be concentrated in practically the same campuses listed by the people from the DIA, too. In general, responses from DACS’ people were notably shorter than those from their DIA counterparts and lacked of examples. This could be another indication of the low involvement and knowledge regarding research that prevails in general within the DACS.

The state of research at the campus

Although showing discrepancies in whether the research was sufficient or insufficient, all interviewees agreed that Querétaro campus was conducting research, which most classified as applied. The agreement also prevailed when the time came to mention where research was taking place: Research was almost exclusively associated with the DIA. According to an academic administrator of the referred division, “DACs’ professors are barely involved in research; only one of them ‘raised his hand’ for support, so institutional funds for research are primarily being funneled to the DIA”. Statements made by people from DACs confirmed this lack of involvement. In addition, they rushed to point out the reasons preventing their division from the pursuit of research. Specifically, teaching rather than research was mentioned as the campus focus. Professors’ disinterest in research reinforced with a reward system that praises teaching completed the picture. Actually, a professor stated that a “professor’s apathy is also an inhibitor; they feel comfortable with just teaching. In practice, our reward system does not prize research but prizes good teaching evaluations from the survey administered to students and a professor’s involvement in campus recruiting activities”. By the same token, an academic administrator assured that DACs’ professors “refuse to engage in research when they have been asked, arguing that they were not hired to conduct research. More teaching is what they are interested in because of the additional income it represents”. Despite the numerous testimonies affirming that the campus is currently allocating financial resources as well as relieving professors from some of their teaching load in order to facilitate the pursuit of research, some people argued that precisely the

teaching loads and lack of institutional funding were hindering research. Hence, once again DACS' people exhibited that they were unaware of the campus research strategy in place.

As mentioned above, the DIA is facing a very different reality regarding research. In fact, all the academic department heads as well as the programs' heads recognized that research was taking place at their units. Its flourishing was primarily credited to campus decisions aimed at lowering teaching loads, establishing endowed chairs, hiring research assistants, allocating financial resources to the activity, and allowing them to join research lines and teams outside the campus. Moreover, an interviewee affiliated with the Human Development Office mentioned that "a request for recruiting professors with research experience and holding Ph.D.s has been recently done in the office. In addition, the campus has started counting professor's activities like conference participation and publishing as elements in his/her performance evaluation".

In what appears to be an additional effort to encourage professors to conduct ongoing research, Querétaro campus is requiring them to become SNI members. It was previously mentioned that SNI membership is already required of them for program accreditation purposes. Therefore, the membership offers a double benefit. However, a couple of interviewees mentioned that complying with the SNI criteria is so challenging that some campus professors already gave up on their intentions to pursue a researcher career path within the institution. On the other hand, an academic administrator warned that requiring the referred membership for professors could act against the institution's research

strategy because somehow, professor's research activities are shaped by the criteria used by the SNI for granting and renewal of membership. Specifically, he stated that:

It seems that the criteria to gain SNI membership vary depending on who is in charge. Sometimes, technology development is acceptable and sometimes is not and this could be a problem because the Tecnológico de Monterrey primary orientation is towards applied research. Yet patents seem to be taken into account by SNI, more emphasis toward basic research on its criteria could translate into less SNI memberships within the institution. In the end, SNI criteria could influence the type of research professors may choose to perform, which may also not be in the institution's best interests.

Consequently, seeking SNI membership might represent a double-edged sword for the institution. Finally, most of the DIA interviewees wished the campus to do more research, identifying lack of time as a major inhibitor towards reaching that goal.

Research appropriateness for the campus

All interviewees coincided that Querétaro campus should engage in research, yet their reasons for it varied. Some people argued that engagement in research is simply obligatory due to the campus category of 'first class'. Interestingly enough, this argument was voiced from the DACS. The assumption that research has prestige attached to it led some others to consider research as appropriate for the campus. They also declared themselves convinced that prestige would help the campus to be ahead of its competitors and to be recognized as the best. Hence, research again was seen as a mechanism for differentiation.

It was also argued that research should be the mechanism for Querétaro campus to contribute towards the fulfillment of the institution mission aimed at the country's development. For some interviewees, the opportunity that research offers to help the community to overcome its problems makes it very appealing. According to a professor,

the institution cannot afford “losing its opportunity of acting as a change agent for society”. An academic administrator posited that research gives the campus the opportunity to “influence the region’s development”. By the same token, another professor stated that research “translates into societal gains....everybody gains from research”. For a good number of people, helping industry surrounding the campus is an excellent way of supporting the community. It was mentioned that “the geographic zone in which the campus is located has plenty of opportunities for research oriented to the industry”. Moreover, an academic administrator underscored that “the arriving of more industrial plants to the industrial corridor that Querétaro city is part of is favors the possibilities for the establishment of a research corridor, too”.

The campus faculty itself was for many considered a sufficient reason for the pursuit of research. Several aspects of the faculty were addressed, all for the support of research. To illustrate, it was mentioned that the campus already has a good number of highly qualified professors not only capable of conducting but also demanding research. An academic administrator stated that through research, “the waste of professors holding Ph.D.s and being utilized for just teaching would cease”. Moreover, a top campus administrator stated that “the campus would lose its professors if either it keeps from engaging in research or it does not allow them to do research no matter the schemes. The campus academic level would also decrease because professors really make the difference”. By the same token, a professor assured that “some professors will become disappointed and others will surely leave if the campus abandons research. Academic quality will also diminish”. Under this perspective, research acts as a mechanism for

pleasing and retaining professors interested in the activity. Finally, holding greater authority in the eyes of their students was referred to as a positive outcome from having professors pursue research.

It is noteworthy to mention that there were disagreements on whether the campus was ready to engage in research. For an academic administrator, both the institution and the campus are “ready to initiate applied research even having just a modest car to compete in the race. Of course, it is not ready for basic research because of the investments it requires”. In the words of a professor, “Querétaro [campus] is ready to undertake research because it has enough human talent to succeed”. Another academic administrator agreed with it and added that “the necessary infrastructure can be built little by little”. On the other hand, there were some people expressing that both the campus and the institution were ready for the activity to a certain degree. Embracing this perspective, an academic administrator posited that regardless of it,

Sometimes, it is the only way of breaking inertia. However, people within the institution should give it a vote of confidence....Professors should be optimistic that the institution will find the way to succeed in the research enterprise as it has happened in the past with other endeavors.

For a DACS’ administrator, “the institution is ready only for initiating its learning path to research rather than for producing tangible results as published papers”. Sharing this assessment, one professor stated that “the institution is ready for beginning to aspire to do research but not for doing research”. Lastly, there were two people convinced that the institution was not ready to engage in research. They argued that organizational changes aimed at facilitating professors’ involvement in research needed to be introduced first.

Necessary actions to further endorse research

In essence, everything demanded as necessary for the promotion of research by people at León campus was also demanded by people from the DACS at Querétaro campus. Hence, their demands point at the necessity of declaring research as a campus goal, the urgency for relieving professors of some of their teaching loads, the importance of introducing organizational changes aimed at facilitating the pursuit of research, acknowledging the campus obligation to allocate financial resources for research, and to implement appropriate reward systems. The concordance should not be surprising given that, for all practical purposes, most people at DACS are unaware that their campus has a strategy in place to support research. Interestingly enough, people from the rest of the campus also requested some of the actions just mentioned. Nonetheless, it is important to do not lose sight of the fact that DACS people made their requests based on the assumption that nothing has been done in that regard.

With respect to the teaching loads, a DIA's academic administrator agreed with those requesting less teaching for professors. However, he also recognized that "academic policies limit the number of courses that a professor can be relieved of. However, it is understandable because these policies were created having in mind teaching as the main purpose of the institution". Being specific, one professor stated that "a professor should not teach more than 3 courses per semester in a flexible scheme". The proposition was seconded by an academic administrator arguing that "relieving professors from one course is insufficient; three courses would be more appropriate". Also agreeing on the request, another academic administrator related that "even people from ABET [an

American accreditation agency] were amazed after knowing our teaching loads". Finally, some people emphasized that in addition to determining reasonable teaching loads, academic policies should be established to match a professors' teaching with their research focus.

It was also pointed out that even professors already relieved of some teaching and engaged in research are still at risk of being asked to increase their teaching when academic departments are unable to fill teaching positions. In the words of an academic administrator:

It has happened that heads of academic department refuse to release professors of more than one course, arguing the difficulties associated with hiring substitutes as well as the negative consequences that losing a professor would have on the campus performance evaluation, so it is a double discourse: the official policy becomes unofficial at the moment of truth.

In this respect, it is noteworthy to mention that in 1997 the value of research conducted at each campus was added as an indicator to evaluate the performance of each campus. Nonetheless, the evaluation system currently takes into account another 30 indicators and this particular one is not among the most important. Indeed, it is by far less important than those related to student opinions regarding teaching. Consequently, it is understandable that the practice of subordinating research to teaching will not cease until the institution's performance evaluation system signals research as important. Moreover, the use of suitable criteria for research evaluation appears imperative. In the words of an academic administrator:

We need a system to evaluate research performance. Some professors could refrain from doing research as long as research continues without being considered as part of professors' responsibilities and not being evaluated fairly.... It seems too easy for campus' administrators to use the SNI criteria to evaluate research performance. We

are being asked to make commitments in terms of publishing; however, we really do not know what to say because we are just starting. We have neither momentum nor experience on this matter.

On the other hand, it is noteworthy to mention that some people recommended hiring those with research experience as a way of underpinning research at the campus. The rationale was that bringing in a few consolidated researchers to lead research teams would certainly boost performance.

A good number of people called for the introduction of further organizational changes supporting research. In this respect, the administrative criteria used to approach research were frequently identified as a contentious issue. To exemplify, an academic administrator argued that “administrative procedures distract researchers, diminishing their productivity and competitiveness consequently. There are no substantive changes aimed at supporting research”. By the same token, a professor emphatically demanded that “paperwork must not compete with research for a professors’ time. They must be kept from distractions”. Moreover, another academic administrator stated that “it seems that they [administrators] are inviting us to play while putting up obstacles that prevent us from playing. Sadly, the administrative perspective is winning. Administrators can complicate things so much that research could become unreachable”.

Although supported by some people, the current institutional policy requests a professor conducting research to acquire the necessary monetary resources that pay for the substitutes teaching those classes from which the was relieved. This policy was pointed to as an additional source of conflict with administrators either because of the policy itself or because of the criteria in effect to estimate the requested resources.

The need for organizational change was also addressed by arguing that research has never occurred by decree. Alluding to the institution as a whole, a campus administrator stated that “for something to happen it does not enough declaring for it and sometimes, I see people believing that it is enough”. Echoing the statement yet now alluding to the campus, a professor mentioned that “a declaration supporting research is not enough. Academia is neglected; areas like student affairs receive more support than we do”. In addition, an academic administrator stated that “the institution is not longer the leader because we have invested too much in technology and in our educational model instead of our professors. Having the resources, our professors will take the institution again to the forefront”.

The establishment of appropriate reward systems that encourage professors to continue or join research and the allocation of additional funding for research were frequent targets of the interviewees’ requests. It was argued that suitable reward systems would attract people to engage in or continue research. With respect to funding, the issue was addressed from different perspectives. To illustrate, an academic administrator stated that:

More financial resources must be devoted to research; it is the biggest constrain. We are at a great disadvantage with respect to public universities in that CONACYT grants neither scholarships nor stipends to people who are interested in becoming enrolled in our graduate programs even having our programs listed in the PNP [CONACYT’s directory of academic programs considered excellent].

By the same token, another academic administrator underscored the importance of allocating more internal financial resources to research “due to the government tendency to fund mostly public universities”. Based on a different rationale, a professor spoke in

favor of institutional funding arguing that for research to succeed “the institution must bet on it without expecting profits”. Nonetheless, a campus administrator seemed wary of this possibility. She declared that:

Funding for research will come neither from tuition because it already became a skinny cow as a result of too much milking, nor from government and I wonder if the Tecnológico de Monterrey’s trustees are willing to bet their wealth on research.

Finally, an opinion of an academic administrator stated, “professors should not expect to get institutional funds for their projects; they should seek funds outside instead”. Under his perspective working collaboratively with other institutions would make funding more attainable.

With regard to collaborative work, many people urged for it, despite the possible setbacks they previously associated with it. In this respect, an academic administrator stated that “we [the institution] must know about research being carried on at other institutions. We should stop acting as an island, we must be able to work collaboratively; passion for knowledge does not recognize frontiers”. Reinforcing the message, another academic administrator also stated that “we [the institution] cannot start from zero, so alliances with national and international research centers are key to the fulfillment of the research goal”. By the same token, a third academic administrator expressed that “we [the institution] have to seek synergy among our professors by encouraging them to not working alone when having similar research interests. Alliances with other institutions are also important. It will not be easy, but we must work on it”. Calls for collaborative work, of course, were also explicitly directed at industry.

Lastly but no less importantly, an academic administrator emphasized the importance of designing a strategy aimed at having research embedded in the Tecnológico de Monterrey. He specifically stated that “for research to avoid being cut off, it must become indispensable either because of its impact on a student’s formation, its cost-effectiveness, or its effects on institutional ranking”. This statement validates one of the propositions formulated by Hackman (1985) in her theory of resource allocations. In particular, the one stressing that a unit’s centrality to the institution’s mission determines the allocation of internal resources it receives. Hence, the administrator’s assertion aimed at making research become central to the institution as a way of securing internal resources and permanence consequently is fully consistent with the theory’s proposition.

Conclusions

Despite a wide variety of explanations related to the Tecnológico de Monterrey’s motives for including research as part of its mission, the findings of this study have demonstrated broad agreement on and commitment to that activity among the people interviewed. With regard to the type of research to be pursued, applied research was always included in the interviewee responses, except for one case. Nevertheless, basic research was also considered into the research formula, with professors who mostly took that stand. Yet the focus of research is a target of divergences and disappointments.

The findings also show that, apart from the campus’ official research orientation, many interviewees judge engagement in knowledge creation as critical for campus survival in the long run. Moreover, the development of first and second class campuses and/or disciplines is an expected consequence of the institution’s prevailing research

strategy. The statements made in this regard gain importance given the rejection facing the establishment of research networks across the institution.

Lastly, the differences regarding awareness of and commitment to research present at Querétaro campus reveal that, for a campus declaring research as part of their goals, an allocation of resources towards that purpose and reductions in faculty's teaching loads may not be enough for engaging people in the research endeavor. The findings also suggest that centrality and power are useful concepts for explaining disparities within campuses regarding resource allocation.

CHAPTER VI: CONCLUSIONS

Introduction

This chapter summarizes the findings of this study by linking them to the research questions. An assessment is also included regarding the helpfulness of the theories to explain the institutional drift phenomenon. Furthermore, some clarifications and recommendations to the theories are presented. Next, implications and recommendations for the institution to concentrate on and/or take care of in order to succeed in its research endeavor are introduced. The chapter closes by presenting some considerations regarding further research.

Revisiting the purpose of the study and research questions

The purpose of this study was to explore the rationales and strategies associated with increasing engagement in sponsored, applied research in a private Mexican university system. The resistance and commitment of people within the institution regarding this research orientation were also addressed. Furthermore, the study focused on the capacity required to fulfill the research goal as well as on the stratification across the organizational units within the institution that resulted from this process.

The research questions are reintroduced next aiming to underscore the findings related to them. The first research question and its sub-questions were:

1. What are the rationales and strategies behind the institution's orientation towards conducting sponsored applied research?
 - 1.1. To what extent is that orientation being realized?
 - 1.2. What sources of support/resistance to the research orientation are evident?

The findings suggest that a commitment to contributing in the generation of greater well-being in Mexico's communities is the main driving force behind the Tecnológico de Monterrey's research orientation. Indeed, a strategy has been developed in order to fulfill that commitment. The strategy visualizes the institution acting through knowledge creation and its transference as an engine that will bring the country into competition with knowledge-based economies, a considered necessary step to accessing the ultimate purpose of well-being. Moreover, the institution has decided to concentrate its efforts at eight of its campuses regarding knowledge creation. These campuses are known as research oriented. Continuing education is considered within the institution as a primary vehicle for the transferring of knowledge and is primarily reserved for the so-called non-research oriented campuses. The fact is of great significance because American research universities rarely if ever consider continuing education as an important mechanism for knowledge transfer. The establishment of technology-based business incubators and technology parks are conceived by top administrators at the institution's system level as enablers of the Mexico's transformation process.

The findings also demonstrate a wide coincidence between people interviewed at the institution's León and Querétaro campuses and those occupying top positions at the institution's system level regarding what is behind the Tecnológico de Monterrey's commitment to research. Nonetheless, additional rationales were presented. To illustrate, congruence with what a university is supposed to do was the way some interviewees made sense of the institution's engagement in research. In this respect, it was expressed

that universities are incomplete if research is missing. For them, the institution is seeking legitimacy from society and research is the means to achieve it. For others, the research goal is simply a response to the institution's faculty demands in that regard. Under this perspective, engagement in research is intended to prevent professors with a Ph.D. from leaving the institution because of its lack of research.

People often stressed at both system and campus levels that research is also being pursued because of its association with prestige, which they considered as an effective way of both differentiating the institution from its domestic competitors and earning prestige internationally. In fact, aiming to achieve these goals, the institution is requiring all of its campuses to have all their academic programs accredited at least by domestic agencies. Moreover, eager to differentiate as much as possible, some campuses –usually the wealthiest- are taking its programs or units beyond domestic accreditations. Lastly, the Tecnológico de Monterrey's admission standards were recently raised. Many of the interviewees pointed out that the rationale for this decision is that the institution will be in a better position to conduct relevant research and consequently be more prestigious by having the best and brightest students along with stellar faculty and high quality academic programs (i.e., accredited).

Despite the fair level of agreement among people interviewed with the official rationales for research, some people at León strongly disapproved the faculty retrenchment with the campus has been dealing with, arguing that it prevents the campus from engaging in research. They also stated that the declaration of research does not make sense when a professor must teach 5 courses each semester. Nevertheless, the

nonexistence of an environment conducive to research at this campus is congruent with the fact that no research is currently its research strategy. This is unsurprising after considering that the campus is not classified by the institution as research oriented. Hence, strengthening teaching rather than engaging in research was reported as its main priority. In accordance with this orientation, the campus is focusing on knowledge transfer under the modality of continuing education.

With regard to Querétaro, the findings reveal that a strategy favoring research is in place there, which is in consonance with its status of research oriented campus. Nonetheless, two opposite realities regarding the existence of the campus research strategy were found. Interestingly enough, each of the conflicting versions is clearly associated with one of the two existent academic divisions in the campus. Being specific, one of the divisions acknowledges and even praises the existence of a strategy aimed at research. Moreover, the division is working actively to encourage its professors to engage in research. Interviewees affiliated with that division mentioned that campus decisions aimed at lowering teaching loads, establishing endowed chairs, hiring research assistants, allocating financial resources to the activity, and allowing them to join research lines and teams outside the campus have all permitted research to flourish. The other side of the coin is that, except for its dean, all the interviewees working at the other campus' academic division denied the existence of a campus strategy promoting knowledge creation. Indeed, the alleged nonexistent strategy was the target of their complaints, arguing that the campus category of 'first class' (i.e. research oriented) makes the implementation of such a strategy obligatory.

Because of its alleged faster and greater impact on Mexico's development, applied rather than basic research has been chosen as the primary type of research to be pursued by the institution. Focusing research on certain areas such as biotechnology, health sciences, mechatronics design, information and communication technologies, management and public policy, and incubation of technology-based business, among others, is also part of the institutional strategy regarding research. Unsurprisingly, the focus of this effort is primarily the few campuses labeled as research oriented, which in turn reinforces their central role regarding fulfillment of the research goal.

Apart from type and focus, the institution's research strategy also requires research to be sponsored and self-sufficient. In order to meet these criteria, researchers usually need to buy their own equipment if the project they are working on requires it. Furthermore, in compliance with both the applied research and the self-sufficiency paradigms, the institution has been seeking funds from external sources and experiencing positive results. However, its Monterrey campus –a research oriented one- has been the main beneficiary so far.

Aiming to coordinate the design and implementation of the Tecnológico de Monterrey efforts regarding its research strategy, a vice-presidency for research and development has been created. In addition, endowed chairs have been established through institutional funding. The vast majority of research performed through endowed chairs is focused on areas considered strategic to the institution. Nevertheless, the uneven distribution of research-related resources across campuses has resulted in concentration

of endowed chairs in a handful of the so-called research oriented campuses within which Querétaro is not included; it has established only two endowed chairs.

Internal research networks are considered by the institution as an appropriate mechanism for having all its campuses contributing in different ways to the fulfillment of the research strategy. Hence, research networks will allegedly allow professors across the institution to directly participate in research activities, especially those working at non research oriented campuses and/or academic departments. Theoretically, all a professor needs do is join, through the network, a research team working on the topic in which he/she is interested. However, the findings reveal that it remains unclear how networks can be built among campuses to avoid the drawbacks that people at all levels of the institution already have identified. To illustrate, after recognizing that collaborative efforts among campuses are decisive for the networks to succeed, it was mentioned that usually “every campus aspires to both do and have everything.” Moreover, it was stressed that the institution has always promoted competition rather than collaboration among its campuses.

The findings also point out that, except for one professor, all people interviewed at León campus backed the scenario in which campuses do not contribute to the research strategy in the same way. Some of the interviewees –none of them professors- expressed their agreement by pointing out that concentrating knowledge creation in a few campuses and/or areas is more effective and efficient. Therefore, they did not consider the scenario troublesome in which campus resources determine its participation in the institution’s research strategy. For a few others, a campus level of participation in research simply

reflects the demand and support that it has from government, industry, and the community in which operates. With regard to professors, their rationale for supporting the not-all-participating scenario is very different. They argued that compliance with the self-sufficiency criterion is what makes research virtually impossible for some campuses, especially small- and medium-sized campuses.

People interviewed at Querétaro took the same stand as those at León regarding the level of inclusiveness of the institution's mission with respect to research. That is, they coincided that not all campuses are called to do research. However, in general, responses from people affiliated with the academic division disengaged from research were notably briefer than those from their counterparts at the other division and lacked examples. This could be reflecting the low involvement and knowledge regarding research that prevails in general within that division.

Contrary to that observed at León, statements made by the faculty at Querétaro campus were not different from the rest of the interviewees in a noticeable way. In addition to the statements already put forth at León campus supporting the scenario in which not all campuses pursue knowledge creation, the uneven distribution of people trained to conduct research (i.e., Ph.D.'s) across campuses was identified as a hindrance in that regard. It was also asserted that concentrating research on a few campuses is "the only possibility to positioning the institution as a real university."

When asked, people at Querétaro widely agreed to list the campuses supposed to engage in research and always included their campus in the list. In fact, although showing discrepancies in whether the research was sufficient or insufficient, all interviewees

agreed that Querétaro campus was conducting research, which most classified as applied. The agreement also prevailed when statements pointed out that research was almost exclusively associated with the division aware of the existence of the campus strategy in that regard.

When it comes to deciding which campuses should conduct research, the findings show that most people at León do not want their campus to be omitted. Indeed, almost all of the people interviewed agreed that sooner or later, the campus must engage in knowledge creation. Compliance with the institution's requirement of having all academic programs accredited was among the many arguments offered in support. This research aspiration is highly relevant given the virtual absence of research reported at the campus derived from its no research strategy.

In general, people at León campus dislike the possibility of joining research through the research networks promoted by the institution. Their expectations of undesirable outcomes associated with the referred networks seem to be the primary reason for their position. To illustrate, some of the interviewees are skeptical about the consequences of having a professor from one campus joining a team of researchers located at a different campus, but working on research considered not of interest for the professor's campus. The constitution of the networks having the largest campuses as their hubs was also criticized.

The findings also show that Querétaro campus is being proactive in encouraging its professors to engage in research, regardless of the form the referred networks could finally adopt. To exemplify, the campus is giving its professors freedom to join any

research center outside the campus and/or to advise Ph.D. students from other institutions in order for them to engage in research. Interestingly enough, even at León it has been declared that collaboration with the several research centers located nearby in the region is a much better option than trying to establish research centers at the campus.

Lastly, the commercialization of knowledge is listed among the priorities within the Tecnológico de Monterrey's research strategy. Similar to the self-sufficiency criterion for research, it is seen as a mechanism to fund further applied research and to eventually enter into conducting basic research. The search for an appropriate formula on knowledge commercialization has forced the institution to look at what foreign universities are doing.

The second research question and its sub-question were:

2. To what extent are people within the institution resistant or committed to its research goal?
 - 2.1. What kind of research, if any, do they believe the institution should conduct?

In regard to this question, the findings underscore that neither at León nor at Querétaro campuses was it stated that the Tecnológico de Monterrey should not be committed to research. With respect to the type of research desirable, applied research was always included in the interviewee responses, except for one case. Nevertheless, basic research was also considered into the research formula, with professors who mostly took that stand. Moreover, top administrators never favored the pursuit of basic research.

Those interviewees who considered the pursuit of basic research in combination with applied research as appropriate for the institution often visualized it as being reached after the institution has a good grasp of applied research and the resources it demands. Actually, some people identified applied research as the resource provider for basic research. In addition, the needs of society and the country were always mentioned as the reasons for basic research to exist.

Arguments from those inclined exclusively towards the pursuit of applied research varied. To exemplify, it was asserted that applied research is what Mexico needs most to catch up with the developed world as well as to solve some of the many problems prevalent in Mexican communities. Another rationale praised the alleged applied research capability to quickly produce tangible results that translate into societal benefits, such as higher employment levels. In the eyes of some interviewees, its association with an application makes this type of research the most suitable when it comes to addressing specific problems challenging the country, the regions where the institution has its campuses located, and/or the industry. A good deal of justifications focused on financial resources availability, often considering it a decisive factor. Under this perspective, basic research is not affordable to the institution.

Interestingly enough, references to industry rivaled society and the country regarding the target and justification for applied research. That is, there is strong agreement that helping industry to overcome its problems justifies the pursuit of applied research by the institution. Reinforcing this position is a perceived greater availability of external

resources from industry to fund applied research coupled with the alleged institution's vocation towards practical, applied issues related to industry.

Despite the wide agreement about the appropriateness of applied research, two words of caution were voiced regarding some of its implications. The first one stressed that "findings from applied research are more difficult to get published as research papers due to confidentiality requests from those sponsoring research." The second one warned that "applied research could keep the institution from strengthening its presence in society."

In respect to the focus for research, responses primarily were directed to the campus level. Nonetheless, responses at León did not target specific areas, but rather stressed that research conducted by the campus must be directed to help the surrounding community overcome its problems. Industry-related problems were most frequently mentioned when further information was required. Specifically, local industry's lack of competitiveness was repeatedly raised. In addition, some interviewees stated that research conducted by the campus should concentrate on niches that allow the campus to take advantage of its competencies. Alas, no one explained what the campus competencies could be. Therefore, it is fair to say that people at León campus do not have a clear strategy in mind regarding what the focus of research should be.

Contrary to what happened at León, most interviewees at Querétaro campus specified areas on which research should focus. Perhaps reflecting their situation, statements made by the interviewees working at the campus' academic division disengaged from research urged the campus to determine the areas of focus. Responses from people associated with the other academic division varied widely. Interestingly enough, some interviewees

equated community needs with industry needs, calling to subordinate research accordingly. Some others even called to conduct research only on areas where external funds become available or to disregard specific disciplines no matter the consequences. The people apparently more knowledgeable about the focus of the campus research strategy openly expressed either their agreement or disagreement with it. Of particular concern was the shift in the focus of campus priorities from manufacturing systems and architecture to biotechnology and aeronautics. In addition, academicians urged the campus to open more research lines and to match them with professors' interests. Despite all of the above mentioned, the study findings suggest that academic administrators at Querétaro campus are determined to support primarily those research projects aligned with the few areas becoming campus strategic priorities.

The third research question and its sub-questions posed by this study were:

3. How feasible is fulfillment of the research goal?
 - 3.1. Do people within the institution believe that the institution has enough resources to undertake the research challenge?
 - 3.2. Do people within the institution anticipate/see greater stratification among campuses as a result of the research orientation?

In regard to this question, the findings reveal that all León campus professors expressed that the campus faculty was ready to engage in research. However, they underscored that the absence of both a campus strategy aimed at research and appropriate organizational structures were preventing them from engaging in the activity. Indeed, a great deal of demands originated not only by professors was formulated in this respect.

To illustrate, research advocates are asking the campus' top administration to set the tone for research by clarifying what an interviewee called the "how's, who's, what's, why's, and where's of research." In addition to the clarifications, many people demanded from the campus' top administrators specific changes such as a redefinition of the professor's role in order to make it compatible with research. Particularly, all of them agreed on the necessity of reducing faculty workload. Changes in the reward systems aimed at promoting research along with institutional funding were also demanded.

Interestingly enough, people often referred to Monterrey, Estado de México, and Ciudad de México as campuses within the institution already operating under organizational structures favoring research. Also noticeable is that the organizational inadequacies identified as deterrents to research at León campus greatly coincided with those mentioned at the institution's system level.

With regard to Querétaro, it is noteworthy to mention that there were disagreements among the interviewees on whether the campus or the institution is ready to engage in research. Responses ranged from "not ready" to "ready only for applied research to a certain degree". Being specific, two people stated that the institution is not ready to engage in research. They argued that organizational changes aimed at facilitating professors' involvement in research needed to be introduced first. Those somehow in the middle said that the institution is ready to figure out how to approach research. Lastly, those most optimistic claimed readiness by asserting that the institution, including their campus, has enough research trained people to initiate the research enterprise and that the missing things can be gradually added.

In essence, everything demanded as necessary for the promotion of research by people at León was also demanded by people affiliated with the Querétaro campus' academic division that declared the campus does not have a strategy in place to support research. Interestingly enough, people from the rest of the campus also requested some of the same things. However, these requests were much more precise, possibly reflecting what they were encountering while experiencing research engagement. To illustrate, the request to reduce teaching loads was supported by citing how people from ABET [an American accreditation agency] were in favor of lower teaching loads. Hiring of people with research experience as a way of underpinning research at the campus was additionally recommended. Lastly, a call for change targeted the policy requesting a professor to acquire the necessary monetary resources that pay for the substitutes teaching classes from which the professor was relieved in order to conduct research. This policy was referred as a constant source of conflict with campus administrators.

Despite the absence of research at their campus or perhaps as a consequence of it, people at León seemed aware of the implications that different levels of research activity within and across campuses can carry, apart from stratification. To exemplify, it was mentioned that if a campus keeps from engaging in research it will surely suffer from having its professors migrate to campuses better involved in research. Moreover, it was asserted that the student population would also be impacted because they would be attracted to campuses conducting research to the detriment of the other campuses. More than one interviewee pictured the institution as having both first and second class campuses based on their research contributions. Actually, they lamented that León

campus is currently placed in the second class group. The prestige allegedly derived from research was referred as the campus passport to the first class group. Remarkably, only one interviewee (a professor) contemplated the possibility that the institution's call for research might differently impact not only each campus but also the fields within them.

At Querétaro, different levels of campus engagement regarding research and the consequent grouping of campuses in first and second class are seen by some people as inevitable due to different research capabilities. Moreover, it was mentioned that research engagement by those campuses lacking resources would place them even at risk of disappearing. Interestingly enough, it was clearly recognized by the people already engaged in research that, in part because of the institution's self-sufficiency criterion, those campuses and/or areas able to access external funding and/or to conduct research with commercial possibilities will benefit the most. Unequal opportunities for professors and migration of those less benefited were pointed out as a result. Lastly, migration of students and professors was associated with the possibility of having different levels of research within the same discipline across campuses.

Appropriateness of the theoretical frameworks

The three theories employed in this research project –academic capitalism, institutional theory, and Hackman's theory of resource allocation- intended to identify and explain both the reasons for and the implications of steering the Tecnológico de Monterrey towards focusing on revenue-generating research as part of its mission. This section aims to assess the helpfulness of these theories for achieving the purpose of this

study. Furthermore, with the intention of taking into account the study's findings, some clarifications and recommendations are presented.

Academic capitalism. It is noteworthy to mention that academic capitalism was first introduced by Slaughter and Leslie (1997). However, they presented it as a concept rather than a theory. Their central argument was the change in the structure of academic work in research universities resulting from the globalization phenomenon. These scholars found that, within the context of globalization, market interests were increasingly determining the type and focus of research at the so called research universities. Less teaching from faculty in compliance with the market rules was identified among the most important implications of the shift.

As globalization and the knowledge economy have become more pervasive, engagement in academic capitalism has increasingly been observed at virtually any type of college and university. Moreover, its implications can now be felt almost everywhere within these institutions. The significance of the phenomenon led Slaughter and Rhoades (2004) to formulate the theory of academic capitalism.

Given that this theory was developed encompassing not only research universities but all kinds of higher education institutions, it was deemed the most appropriate theory to apply in the case of the Tecnológico de Monterrey. Specifically, the theory of academic capitalism was primarily used for assigning meaning to the collected data at the institution's system level. It was very helpful in illuminating the Tecnológico de Monterrey integration process into the knowledge economy. Through the lenses provided by this theory, it was also possible to identify, analyze, and ultimately associate the

academic capitalism knowledge/learning regime with those strategies and policies being adopted at the institution intending to secure revenue streams. Furthermore, the theory gave context and meaning to all the new circuits of knowledge, the interstitial organizations, and the expansion of managerial capacity developed from the referred strategies and policies. Lastly, based on the academic capitalism claims, it was possible to visualize how the imbalances within and across the institution's campuses are sharpening stratification as a result of the implementation of the research strategy.

Despite the above mentioned, the findings revealed some facts related to both the institution and its approach towards research that are not explicitly contemplated within the theory of academic capitalism. Although it can be asserted that in general terms the Tecnológico de Monterrey is adopting an academic capitalism regime while implementing its research strategy, there are two important twists deserving consideration. First, while the use of state resources by colleges and universities when integrating into the knowledge economy are central to the arguments for academic capitalism, this is hardly the case regarding the Tecnológico de Monterrey. The assertion is based on the fact that the institution in question did not receive any allocation of state resources, with the exception of some modest grants and the small tax benefits associated to its condition as a nonprofit organization. Therefore, in the case of the Tecnológico de Monterrey in particular and the Mexican nonprofit higher education institutions in general, the implications of the use of state resources in the pursuit of academic capitalism are likely to be of lesser significance. This is especially true when compared to results from considering colleges and universities operating in environments similar to

the ones from which the theory of academic capitalism developed. Second, the theory of academic capitalism does not report that higher education institutions choose engaging in an academic capitalist regime as a means of better serving society. However, the findings of this study clearly point out that this is the case for the Tecnológico de Monterrey. The institution's explicit commitment "to play a more active and dynamic role in generating greater well-being in the country's [Mexican] communities" as referred by its president while introducing the Tecnológico de Monterrey current mission is either explicitly or implicitly cited throughout the data gathered. That is, societal improvement was a topic brought in by interviewees and appearing in documents repeatedly. The findings did not reveal evidence of the existence of different motives for the institution's commitment to research. Hence, in many respects, societal benefit is neglected when higher education institutions engage in an academic capitalist regime (Slaughter & Rhoades, 2004) and the implications of such an engagement will surely be different when societal benefit prevail as the ultimate goal.

With regard to the undesired aspects of academic capitalism, Slaughter and Rhoades (2004) make clear that engagement in the regime is not inevitable. However, they present as lamentable the fact that "currently, colleges and universities follow a market rather than a social welfare alternative" (p. 332). Furthermore, they present alternatives from which higher education institutions can choose as a way of linking to the knowledge economy. The alternatives they propose do not require colleges and universities to refrain from maximizing external revenue generation but to devote these resources to societal improvement which is supposed to be their ultimate goal. Interestingly enough, evidence

collected through this project demonstrates that the Tecnológico de Monterrey is complying accordingly. Indeed, by stating that the institution will “establish centers for the transfer of knowledge for sustainable social development” its seventh mission strategy justifies the efforts in this respect. The commitment associated with this strategy is so important that a vice-presidency for social development (VDS) was created in August 2006. Moreover, on February 20, 2007 while addressing the institution’s board of trustees, the board’s president reminded them that “we have a great responsibility in building the country we dream of: a viable country with greater economic and social well-being”. In consonance with the declaration and also with the intention of grouping and coordinating the different initiatives currently operating at the institution towards the fulfillment of its referred social commitment, the Institute for Sustainable Social Development (IDeSS) was also established that very same day. Programs such as PrepaNet and the Community Learning Centers (CCAs) represent the institution’s two most important initiatives that have become part of this institute. According to its website, the IDeSS has the goal of “offering educational and entrepreneurial programs as a contribution towards the human, economic, and social development of those communities lacking opportunities for both the creation of wealth and employment and the improvement of their living standards”.

PrepaNet is introduced at the institution’s website as an online education program created for those who, for economic and/or geographical reasons, did not have the opportunity to complete their high school studies and wish to do so. It is intended to contribute to the reduction of the educational gap so prevalent among the underserved

population in Mexico. All course contents are designed by professors of the Tecnológico de Monterrey and its undergraduate students work as tutors. In fact, tutoring in this program is considered valid for the completion of the minimum 240 hours of community social service required to all undergraduate students. Tuition charged at this program is very low. Nonetheless, scholarships are easily granted by the institution to those applicants unable to afford it. PrepaNet started to operate in 2004 and it currently enrolls 2,440 students. The goal is to increase this figure up to 10,000 by 2009 (“Acortan brecha,” 2007).

With regard to the CCAs, they were created in 2001 and operate as educational spaces for people in geographically isolated areas or who lack traditional education services. These centers bring those who attend them closer to computer technology and networks, through which these centers offer courses in support of basic education, as well as courses on community development, health, and family. It is noteworthy to mention that access to PrepaNet is also granted through the CCAs, so PrepaNet students are not required to have computer access to the Internet on their own. The joint efforts of private commercial organizations, government agencies, and non-governmental institutions all led by the Tecnológico de Monterrey have made possible the existence of the 1,630 CCAs located in the majority of the marginalized micro regions of Mexico, as well as in the Southern part of the United States. Remarkably, the United States hosts 139 of the 1,630 CCAs targeting mostly Hispanic migrants.

In addition to these initiatives, the IDeSS is including into its goals promoting the establishment and development of small businesses within its target communities

("IDeSS: una," 2007). Aiming to achieve this new goal, on February 15, 2007 the institution agreed with the Mexican secretary of economy on the creation of a network of 100 business *social* incubators. The granting of small loans is contemplated as part of the agreement ("Generarán crecimiento," 2007). Indeed, the Tecnológico de Monterrey is so committed to the success of this project that its president has declared that the institution is borrowing financial resources from both national and international organisms to create a 55 million dollar fund to finance businesses developed from the social incubators. In addition, he estimates that by 2010 approximately 60,000 new jobs will be created by the network annually thereafter ("Un nuevo reto," 2007). Finally, it is noteworthy to mention that government authorities are partially funding the establishment of branches of the IDeSS and publicly recognizing the role that the Tecnológico de Monterrey is playing in supporting disadvantaged communities. To exemplify, on March 2, 2007 the governor of the state of Jalisco stated, during the inauguration of an IDeSS in his state, that "this [the IDeSS] is an example of how we must work to achieve results within our community; an example of how public and private institutions join efforts towards well defined objectives" ("Inauguran IDeSS," 2007).

Recapitulating, through the IDeSS and the initiatives it contains, the Tecnológico de Monterrey is effectively counteracting the undesirable aspects of academic capitalism pointed out by Slaughter and Rhoades (2004). The alternative that the institution is opting for demonstrates its determination to promote society's development as its ultimate goal.

Institutional theory. Institutional theory was primarily used for assigning meaning to the collected data at both the institution's system and the campus level. It was very useful

in gaining understanding of the *dedifferentiation* (i.e. homogenization) process in which the Tecnológico de Monterrey is engaging as a means of legitimation. Furthermore, the theory allowed identifying how the emphasis on knowledge creation placed by knowledge societies is leading this institution to emulate those universities already contributing in that regard. The coercive, mimetic, and normative mechanisms through which DiMaggio and Powell (1983) assert that institutional isomorphic change occurs at organizations proved invaluable to understanding how internal and external agents and/or the uncertainty prevailing at the institution regarding means and ends associated with its research goal are influencing the Tecnológico de Monterrey in general, and its campuses in particular to copy those universities/campuses they perceived as prestigious and legitimate in the research endeavor.

Despite the above, it is noteworthy to mention that DiMaggio and Powell (1983) did not envision the possibility that organizations may consider other foreign organizations as part of their organizational field. The implications of this for higher education are that institutions in one particular country could use foreign organizations as their reference for comparison and subsequent change, as the findings of this study have demonstrated in the case of the Tecnológico de Monterrey. Being specific regarding research, interviewees' responses and document analyzed made clear that the institution is judging not only the UNAM but also research universities primarily located in the United States as successful and part of its organizational field. That is what at least partially explains why the institution is concerned with improving its reputation in both the domestic and the international arenas. Seeking prestige, the institution is permanently willing to comply

with standards imposed either by domestic or international accreditation agencies. Indeed, the findings show that the Tecnológico de Monterrey takes great pride in its accreditations, especially when they are considered helpful in differentiating from its competitors. In its search of a suitable strategy for the commercialization of knowledge, the institution also makes evident that the universities deserving consideration as examples to follow are not domestic but foreign. Lastly, the findings have also demonstrated that, even when motivated to differentiate itself from its domestic competitors, the institution has raised its admission standards also aspiring to be considered as prestigious as its reference institutions in the United States. In conclusion, the study's findings suggest that the Tecnológico de Monterrey is adopting practices/roles of foreign universities considered successful, assuming that its stakeholders are attaching the institution's legitimacy to this behavior. Therefore, it can be asserted that when considering both domestic and foreign organizations as part of an organizational field, institutional theory would better explain how institutional isomorphic change occurs in organizations, especially under the framework provided by globalization in general and the knowledge economy in the particular case of universities.

Hackman's theory of resource allocation. The analysis of the collected data at the two campuses sampled for this research project partially relied on Hackman's theory of resource allocation. Despite the fact that this research-based theory was developed for explaining budgetary gains and losses in times of financial difficulty, which was not the case for the Querétaro campus, it was very appropriate to understand the allocation of resources across campuses within the Tecnológico de Monterrey as well as across units

within each of its two campuses considered here. To illustrate, the theory's core concept of centrality elucidated the gains in institutional resources that the so-called research oriented campuses, especially the three largest ones, are experiencing. The concept helped identify the marginalization that the León campus is suffering regarding research. Furthermore, the association between centrality and power and between power and dependence introduced by Hackman (1985) were very helpful in clarifying a) how the concentration of resources considered as critical for achieving the institution's research goal determines the allocation of resources across campuses; and b) why the allocation of resources within units at any campus favors those units aligned with the campus priorities regarding research. In conclusion, Hackman's theory of resource allocation aptly demonstrated the phenomenon under study. That is, there were no aspects of the process of resource allocation linked to the Tecnológico de Monterrey's research strategy that this theory failed to address appropriately.

Implications for practice

Drawing on the findings and theoretical framework of this study, other scholarly work, as well as some additional facts, other than those already presented throughout the findings, this section points out areas on which the Tecnológico de Monterrey should concentrate on and/or address in order to succeed in its research endeavor.

First, acting as engine of a country's development seems to be a plausible and even beneficial role for universities to play. Since long ago, American universities have been called to play this role for the sake of U.S. competitiveness (Slaughter & Rhoades, 2004). Nevertheless, Florida and Cohen (1999) argue that a university's contributions as a result

of acting as engine of development can end up being sterile in the absence of governmental policies setting the right conditions to allow the transformation of these contributions into tangible economic development. They support their claim positing that turning academic innovation and discovery into national/regional growth is neither a linear nor short process. Therefore, they call for public policies creating environments conducive to a country's development as a strategy for taking full advantage of universities' contributions associated with their role as engines of development. By the same token, Enríquez (2000) stresses the necessity of creating environments attractive enough for researchers to work as well as for its discoveries to help countries thrive.

From the above mentioned, it is fair to say that apart from continuing work on its commitment to acting as a Mexico's development engine, the Tecnológico de Monterrey must permanently encourage public policymakers to design and implement policies aimed at both underpinning its role and allowing its contributions to effectively translate into development for the country.

Second, the proliferation of technology transfer offices within American universities during the last 20 years manifests their desire for additional revenue streams through the commercialization of knowledge. It is even argued that the technology transfer activity has become an accepted, indeed valued, part of the research universities' missions (Feller, 1997). Patenting, licensing, and royalties have been placed at the core of these offices. Moreover, scholars have pointed to successful legislation that encourages universities to succeed in this regard (Powers, 2006; Slaughter & Rhoades, 2004) and the impact it has had on the surge of academic patenting since the early 1980s. Nonetheless,

patenting does not necessarily lead to licensing or to royalties which are the ultimate target of the technology transfer offices. In fact, Powers (2006) points out that since 1997 universities' invention disclosures per license have not increased and that invention disclosures per new patent application have declined. When it comes to royalty income, the scholar stresses the fact that in recent years 60 percent of royalties from all universities ended up in just 10 institutions. He adds that a closer look into this selected group reveals that only one or just a few licenses are the money makers. Therefore, evidence proves that most patents never make any money.

The findings of this study show that the Tecnológico de Monterrey is placing a lot of emphasis in patent generation as a mechanism for significant revenue generation. In this respect, a top administrator at the institution's system level declared that "a 'big shot' could result from them [patents] allowing us [the institution] to reach a market niche as well as finance more research" ("Generarán conocimiento," 2006). Furthermore, the institution's efforts towards patenting are already paying off. It was recently reported that in 2006 the Tecnológico de Monterrey was the Mexican higher education institution with the highest number of patents awarded, numbering 17 ("Investigación: Un," 2007). Nevertheless, it is crucial that the institution gains awareness of what the evidence shows regarding revenues from patenting as a way of avoiding false expectations. Moreover, it is worthy of consideration by the institution that, while in the pursuit of patenting, graduate student education may be diverted from its original goals, researchers may get into conflicts of interest, and/or a university's reputation for objectivity may be compromised (Bok, 1994).

Third, the findings of this study show that it is widely believed by those within the Tecnológico de Monterrey that industry operating in Mexico must primarily fund research at universities. The belief is rooted in the assumption that that is what actually happens in the U.S. Alas, statistics in this respect demonstrate the contrary. Indeed, the National Science Foundation (NSF) has reported that for third consecutive time in FY 2004 industrial funding for academic science and engineering (S&E) decreased. Conversely, federal funding for academic research and development (R&D) in FY 2004 increased for the third year in a row. The NSF figures reveal that in FY 2004 federal funding accounted for 64 percent of total academic R&D support, whereas industrial funding represented only 4.9 percent. Moreover, state and local government funding accounted for 6.6 percent while institutional funding represented 18.1 percent. Hence, government rather than industry is by far the big sponsor of R&D at American universities. Surprisingly, the same conclusion is true for R&D at Mexican universities. According to the CONACYT *Informe General del Estado de la Ciencia y la Tecnología 2005* report, the Mexican federal government funded 76.1 percent of total academic R&D, whereas the industry funded only 2.0 percent. Institutional funding represented 19.7 percent. Nonetheless, the case deserves an additional reference point: R&D expenditures at American universities accounted for 40,057 million dollars in FY 2003, whereas the same concept at Mexican universities represented 1,052 million dollars in 2003. Moreover, during the FY 2003, The Johns Hopkins University alone reported 1,244 million dollars in R&D expenditures. From all the above, it can be concluded that unless there is radical change in favor of the amount of industrial and government funding for

academic R&D at Mexican universities, the Tecnológico de Monterrey must commit more internal resources to the research endeavor. Additionally, the institution should implement a much more aggressive strategy to increase its share of government funding towards R&D at universities, which is allocated almost exclusively to four public universities –the UNAM among them.

Lastly, by declaring research as part of its mission and implementing strategies to thrive in that regard, the Tecnológico de Monterrey is also setting the conditions for the development of a new class of faculty: faculty with research skills. The fact must be considered greatly significant by the institution due to its implications. To exemplify, it was reported by some of the interviewees from Querétaro campus that, derived from the close relationship they are experiencing with colleagues engaged in research at research centers located in the campus' surroundings, they have started to notice a great difference in the working conditions between the two groups. Being specific, researchers at the referred centers are required to teach only one or two courses per year, have access to a greater number of research assistants, as well as to better physical infrastructure and equipment. Moreover, differences such as those just listed are becoming evident across campuses within the Tecnológico de Monterrey. Therefore, it should not be surprising for the institution to be asked by its professors for better working conditions which could translate into considerably greater resources. For example, regarding start-up costs for professors in the sciences (those costs expended upon hiring to provide the professor with the necessary research-related resources), Ehrenberg, Rizzo & Condie (2003) have found that average start up costs for an assistant professor at American research universities

range between \$390 and \$490 thousand, whereas for a full professor the figure ranges between \$700 thousand and \$1.44 million.

Faculty with research skills could even force universities to recognize them as a group apart from faculty. The possibility has been addressed by Florida and Cohen (1999) who refer to these people as research scientists. These scholars associate the emergence of this group with the closer ties that universities are developing with industry regarding research. Research scientists are characterized by a focus primarily on sponsored research outside the realm of graduate education; this translates into personal and institutional goals that are different from traditional faculty. It is asserted that the divergences may eventually distract universities from achieving their own goals. From all the above mentioned, it can be concluded that the Tecnológico de Monterrey should be fully aware that increasing numbers of faculty engaged in research might translate into advancement towards the fulfillment of its mission's research goal but that it might also carry unexpected consequences which eventually might not work in the institution's best interests.

Implications for further research

This study has provided insight into what engagement in knowledge creation as a central part of its mission represents for the Tecnológico de Monterrey as a system and for two of its campuses. The motivations and challenges associated with this orientation have deserved special attention within the study. Nevertheless, the findings have cast light on a variety of aspects that should be considered for further research.

First, it was pointed out in the introduction chapter of this study that universities in developing countries are, like the Tecnológico de Monterrey, engaging in knowledge production as a way of linking to the knowledge economy and that the phenomenon has not received scholarly research. Although this study has contributed to alleviate that lack of attention, it is a modest contribution given the magnitude of the phenomenon and its implications. Indeed, the pervasiveness of the phenomenon along with the wide variety of institutions and higher education systems in which it develops could make extrapolations of the findings of this study inappropriate in many cases. Exploring the possibility of different approaches to knowledge creation in addition to the one revealed through this study is of critical importance. How much success are they achieving? Special attention should be directed to the ways in which other peripheral universities are dealing with the challenges derived from knowledge creation. Are these universities also emulating those research universities in the center? Are the environments in which they operate conducive to research engagement? These are only a few ideas intending to make clear that profuse, well planned research is greatly needed when considering the many variations of the phenomenon of institutional drift.

Second, though the theoretical framework chosen for this research project helped illuminating the institutional drift phenomenon, it was pointed out that some aspects presented through the findings escaped consideration. Hence, future research must contemplate approaching the phenomenon through the use of other theories either in combination with the ones used here or instead of them. Better understanding of the phenomenon could result from this practice and new theories could be developed.

Third, this study addressed institutional drift based on the perspectives of faculty members, academic administrators, and top administrators working at a higher education institution experiencing the phenomenon. As previously mentioned, the findings have helped to gain a better understanding of institutional drift. Nevertheless, future research may expand this understanding through capturing the perspectives of others groups of people also involved in the phenomenon. Students, people from the community, industry, and/or the government affected by and/or affecting the phenomenon could provide these additional viewpoints. The findings resulting from these additional approaches should be contrasted and compared with those adopting similar approaches to the one utilized here. Consequently, it is possible that the perspectives of certain groups become the most appropriate for addressing issues, such as to what extent teaching or service is affected at institutions experiencing the referred phenomenon? What are the stands taken by the community, the government, and/or the students regarding these institutions? How do these groups assess the results of universities practicing institutional drift? Are universities achieving the goals that led them to engage in institutional drift?

Finally, it can be argued that the research approach used in this study was not the most appropriated for this particular case, that the used of mixed methods could have better served the purpose of this study or other studies, or that the selection of research methods for addressing institutional drift should be a function of the differences across the environments in which the phenomenon manifests. These possibilities are all worth of consideration when conducting further research on institutional drift.

Concluding thoughts

The findings which resulted from conducting this research project were numerous and highly significant. Altogether, they illuminate the institutional drift phenomenon that the Tecnológico de Monterrey is currently experiencing. Nonetheless, I am convinced that the fulfillment of the institution's research goal may depend on the attention directed by the institution itself to the implications of a handful of them.

First, it is evident that the institution's research strategy is sharpening stratification across and within its campuses. Hence, it is of critical importance that the Tecnológico de Monterrey raises its level of awareness regarding the implications of categorizing its campuses as either research or non-research oriented. In this regard, the findings show that people within the institution are now referring to campuses and fields/programs as first or second class based on their research orientation and their level of research activity, respectively. Further, this translates into condemning a non-research campus or a field/program not close to the market into the second class category. Actually, the polarization of campuses is *de facto* eliminating two of the four tiers introduced by the institution with the intention of classifying its campuses according to the size of their student population. Under this four tier system, campuses are grouped into four categories, namely A, B, C, and D, in which the A category is reserved for the largest campuses while the D category for the smallest ones. It is noteworthy to mention that a new classification system that groups campuses either into the research, regional (two types), or provider categories has been introduced by the institution and aims to replace

the letters system. Nonetheless, people keep associating the groups with campus size because the new system did not rearrange campuses, for the most part.

In my experience as a former campus president, the letters system: a) reasonably reflects campus reality, b) gives each campus fair status in comparison with its peers, c) is widely accepted by campus presidents and their staff, and d) gives each campus a good chance to shine within its category. Indeed, a remarkable advantage of this classification system is that it encourages campuses to compete mainly against other campuses within the same category, which in turn translates into a better sense of achievement among campus community members and spurs campuses to concentrate on their vocation. That is, it relieves a campus of the pressure of emulating campuses with a different vocation. On the contrary, the dichotomy between research and non-research oriented campuses associated with the institution's research strategy in place encourages all campuses to engage in knowledge creation regardless of their chances of succeeding and/or the appropriateness of the activity for them. The negative connotation attached to being considered a second class campus is leading all campuses to consider research as part of their goals. However, the findings of this study suggest that the vast majority of the institution's campuses will not succeed in the research endeavor and the consequences of such a failure might place these campuses in a much more disadvantaged situation than they found themselves before the implementation of the referred research strategy. To make things worse, this scenario is not only applicable to non-research oriented campuses. Indeed, research oriented campuses, other than Monterrey, Ciudad de Mexico, and Estado de Mexico –the three largest, are at risk of failure. Hence, Guadalajara,

Querétaro, and/or the Toluca campuses (fourth, fifth, and sixth largest, respectively) would be downgraded to the second class category if they fail to engage in research. A lower morale within these campuses would be an immediate consequence of such downgrading and certainly not the only one to be worried about. Faculty and student migration from a previous research oriented campuses to the ones effectively engaged in research and the subsequent concentration of other research related resources exemplify such consequences worsening the situation. Remarkably, many interviewees mostly affiliated with the León campus envisioned this scenario.

Recapitulating, the categorization of campuses by research orientation associated with the Tecnológico de Monterrey's research strategy, along with the campuses' feasibility to engage in knowledge creation, is leading many people within the organization to describe campuses either as first or second class. The polarization implied in this visualization carries implications that sharpen stratification within the institution and risks fulfillment of the institution's research goal. Therefore, it is crucial that people in charge of the Tecnológico de Monterrey's research strategy implementation become aware of this situation and act accordingly.

Second, although the term 'research' permeates much of the official discourse at the Tecnológico de Monterrey, little about the necessary conditions for it to thrive is mentioned. In other words, despite the prominent place reserved for research in the Tecnológico de Monterrey's mission, this study did not find an operational definition of research.

In my experience as a doctoral student at a research university and based on what it was voiced by the interviewees who participated in this study, very few people within the Tecnológico de Monterrey seem to know or understand what research demands to thrive and this lack of knowledge/understanding becomes evident in the implementation of the institution's research strategy. To exemplify, there is no doubt that vast library resources are decisive to the achievement of good quality research. Access to published scholarly research informs a researchers' work in various significant ways. My doctoral process has helped me understand why libraries constitute a pillar of research. In addition, libraries demand immense resources in order to fulfill researchers' demands. Nevertheless, only one interviewee –the head of an academic department- mentioned that the Tecnológico de Monterrey library resources are insufficient to conduct research. Perhaps, the institution's lack of tradition in conducting research rather than a conviction that its library resources are sufficient is what keeps its people from realizing the critical nature of library resources for research. Therefore, the sooner the Tecnológico de Monterrey becomes aware of the decisive role that library resources play in the fate of research, the better because the institution has a long way to go in this regard. To illustrate, books in the Tecnológico de Monterrey's libraries are counted by thousands, whereas in American research universities are counted by millions.

Laboratories and other research-related facilities are also considered by many disciplines as indispensable for research. This assertion seems to be mostly the case for the Tecnológico de Monterrey, considering the areas in which the institution is intending to focus its research efforts. Nonetheless, the resources being devoted by the institution to

this regard seem to be short. Utilizing again American universities as a point of reference, space assigned to research facilities in the Tecnológico de Monterrey is very modest when compared to entire buildings or even building complexes that American universities devote to the same purpose.

Because of their influence on research, graduate programs and research assistants deserve special consideration. Research universities always include them in the formula they utilize for knowledge creation. Moreover, these universities rush to recognize that the pace of knowledge creation would be much slower without the participation of graduate students acting in their capacities as research assistants. The same could be asserted regarding the time devoted by faculty to the activity. Although many Tecnológico de Monterrey top administrators showed awareness of all the above, the findings of this study have pointed out that little has been done in this respect. Specifically, graduate programs are offered in most campuses under the modality of distance education. Additionally, at campuses where this is not the case, graduate programs enroll part-time students almost exclusively and research is hardly required for program completion. Unsurprisingly, research at the institution barely relies upon research assistants. Regarding teaching loads, it could be said that there is a consensus that they prevent most faculty members from engaging in research. Indeed, the reduction of teaching loads is what most interviewees identified as the main deterrent for professors to engage in knowledge production. In conclusion, if the Tecnológico de Monterrey does not introduces changes to dramatically increase the number of people engaged in research

and the time devoted by them to the same endeavor, the chances for the institution's research goal to succeed are very slim.

Lastly but not less importantly, it is worrisome to see people within the Tecnológico de Monterrey betting that industries operating in Mexico and/or the government will become major sponsors of research conducted at the institution. In this respect, it was mentioned earlier in this chapter that, according to the CONACYT *Informe General del Estado de la Ciencia y la Tecnología 2005* report, the industry operating in Mexico funded only 2.0 percent of academic research in the country. This fact coupled with the belief that industry is a major sponsor of academic R&D in the U.S. has led people within the institution to be confident that a window of opportunity exist for their prediction to materialize. Unfortunately, NSF figures reveal that in FY 2004 industrial funding represented only 4.9 percent of total academic R&D support. Hence, reality in both places is similar and this makes the prediction appear unfounded. Moreover, there are no signs whatsoever leading to believe that things will change at least in the near future.

Regarding government funding, some data shown earlier in this chapter demonstrates that governmental agencies in Mexico as well as in the U.S. are already a major source of funding for academic research. Unfortunately, in the Mexican case, public policies are mostly responsible to private universities in general and the Tecnológico de Monterrey in particular has scarcely received research grants from the government. As in the case of funding from the industry, there are no signs whatsoever leading to believe that things will change at least in the near future. Moreover, even if changes in the referred policies were introduced allowing private universities to receive public resources to conduct

research, the amount that the Mexican government has recurrently devoted to support academic research is so small that it would certainly not make the difference to the Tecnológico de Monterrey's research strategy. What the institution must do to make the difference is commit internal resources to knowledge creation; there are encouraging examples supporting this statement. To illustrate, it is asserted that the outstanding research performance of the University of California at Los Angeles (UCLA) is much the result of the roughly \$700 million allocated for research activities each year. Actually, the figure is similar to what it receives from the U.S. government towards the same purpose. Without the intention of making a comparison between UCLA and the Tecnológico de Monterrey, it seems that the latter should allocate many more internal resources to research than the \$18 million committed during 2006 (Tecnológico de Monterrey, 2007).

Apart from all the recommendations already made about what the Tecnológico de Monterrey could learn regarding research, this report should not conclude without underscoring a distinctive characteristic that universities worldwide can imitate from this institution. The characteristic to which I refer is the strong commitment to contributing towards a greater well-being in Mexico's communities that drives the Tecnológico de Monterrey's research orientation. The fact is significant because higher education institutions everywhere seem to be willing to link to the knowledge economy with the sole intention of benefiting themselves, whatever the costs. Fortunately, the case addressed by this project has shown that it is possible for a higher education institution to link to the knowledge economy by following a social welfare approach instead. Moreover, the case of the Tecnológico de Monterrey demonstrates that this alternative

does not require higher education institutions to refrain from maximizing external revenue generation but to devote those resources to societal improvement, which is supposed to be the ultimate goal for every institution worldwide. Hopefully, this research project can inspire colleges and universities everywhere to link to the knowledge economy without neglecting societal benefit.

APPENDIX

INTERVIEW PROTOCOL

1. What kind of research is your campus/unit currently conducting? Is it focused towards any industry or particular field?
2. How would you describe the status of research within your campus/unit? How was that status reached?
3. To what extent, if any, is your institution's current research orientation shaping or reshaping activities, culture, and/or structure within your campus/unit? How?
4. In your opinion, does your institution as a whole have adequate resources to undertake the research challenge? What would you say about your campus/unit?
5. In your opinion, are there economic advantages and/or disadvantages to your institution that result from conducting sponsored, applied research? To your campus/unit?
6. In your opinion, are there academic advantages and/or disadvantages to your institution that result from conducting sponsored, applied research? To your campus/unit?
7. In your opinion, are there other advantages and/or disadvantages to your institution that result from conducting sponsored, applied research? To your campus/unit?
8. In your opinion, are all campuses and academic units within them called to equally contribute towards the institution's research goal? Is that happening?
9. Based on your experience, how are the decisions made regarding campus, and/or individual unit contributions towards the research goal?
10. In your opinion, what kind of research, if any, should Monterrey Tech conduct?
11. Do you know other universities currently engaged in the same type of research that your institution is promoting? Can you name some of them? Where are those institutions located?

REFERENCES

- Acortan brecha educativa con PrepaNet [Electronic version]. (2007, February 15). *PANORAMA*, p. INSTITUCIONAL1.
- Albornoz, O. (1993). *Education and Society in Latin America*. Pittsburgh, Pa.: University of Pittsburgh Press.
- Aldersley, S. F. (1995). 'Upward drift' is alive and well. *Change*, 27(5), 50.
- Altbach, P. G. (1998). The university as center and periphery. In P.G. Altbach (Ed.), *Comparative Higher Education. Knowledge, the university and development*. (pp. 29-54). Hong Kong: Comparative education research centre- The University of Hong Kong.
- Altbach, P. G. (2003). *The decline of the guru: The academic profession in the third world* (1st Palgrave Macmillan ed.). New York ; Houndmills, England: Palgrave Macmillan. from <http://www.loc.gov/catdir/description/hol031/2002035260.html>.
- Analizan educación continua y extensión [Electronic version]. (2006, March 10). *CRÓNICA INTERCAMPUS*, 25, p. INSTITUCIONAL.
- ANUIES. (2005). *Anuario Estadístico 2004*. Retrieved February 14, 2007, from http://www.anui.es/servicios/e_educacion/index2.php
- Apoyan investigación y estudio automotriz [Electronic version]. (2005, September 29). *PANORAMA*, p. ACADÉMICO6.
- Apoyan la creación editorial [Electronic version]. (2005, September 29). *PANORAMA*, p. ACADÉMICO2.
- Apoyarán en desarrollo de empresas familiares [Electronic version]. (2005, February 17). *PANORAMA*, p. INSTITUCIONAL1.
- Apoyarán estudios biotecnológicos [Electronic version]. (2005, May 3). *PANORAMA*, p. INSTITUCIONAL6.
- Arnone, M. (2003). The wannabes. *Chronicle of Higher Education*, 49(17), A18.
- Arocena, R. & Sutz, J. (2004). Latin American universities: From an original revolution to an uncertain transition. *Higher education*, 00, 1-20.
- Ashar, H. & Shapiro, J. Z. (1990). Are Retrenchment decisions Rational? *Journal of Higher Education*, 61(2), 121-141.

- Ashby, E. (1971). *Any person, any study; an essay on higher education in the United States*. New York: McGraw-Hill.
- Bastedo, M. N., & Gumport, P. J. (2003). Access to what? Mission differentiation and academic stratification in U.S. public higher education. *Higher Education*, 46(3), 341.
- Berg, B. L. (2004). *Qualitative research methods for the social sciences* (5th ed.). Boston; London: Pearson/Allyn and Bacon.
- Bogdan, R. Knopp, S. (1998). *Qualitative research in education. An introduction to theory and methods*. Boston/London: Allyn and Bacon.
- Bok, D. (1994). The commercialized university. In N. E. Bowie (Ed.), *University-Business partnerships: an assessment* (pp. 116-121). Boston: Rowman & Littlefield publishers.
- Bullen, E., Robb, S., & Kenway, J. (2004). "Creative destruction": Knowledge economy policy and the future of the arts and humanities in the academy. *Journal of Education Policy*, 19(1), 3-22.
- Cantú, F. J., Cruz, H. C., & Ramos, T. J. (2005). *La investigación y el posgrado 2003-2004*. Monterrey, México: Tecnológico de Monterrey.
- Castañeda, J. (2005a, October 13). Aumenta el Tec promedio de ingreso. *Mural*. Retrieved October 16, 2005, from <http://busquedas.gruporeforma.com/mural/default.asp>
- Castañeda, J. (2005b, October 15). Pretende el ITESM emular a Harvard. *Mural*. Retrieved October 16, 2005, from <http://busquedas.gruporeforma.com/mural/default.asp>
- Clark, B. R. (1978). The Insulated Americans: Five Lessons from Abroad. *Change*, 10(10), 24-30.
- Clark, B. R. (1983). *The Higher Education System: Academic Organization in Cross-National Perspective*. Berkeley, CA: University of California Press.
- CONACYT. (2005). *Informe General del Estado de la Ciencia y Tecnología 2005*. Retrieved February 19, 2007, from <http://www.siicyt.gob.mx/siicyt/referencias/publicaciones.do>
- Conrad, C. F. (2001). Grounded Theory: An Alternative Approach to Research in Higher Education. In C. F. Conrad, J. G. Haworth, & J. L. Ratcliff (Eds.), *Qualitative*

- Research in Higher Education* (pp. 255-262). Boston, MA: Pearson Custom Publishing.
- Consolidación de la excelencia [Electronic version]. (2006, Enero 26). *PANORAMA*, p. ACADEMICO7.
- Construirá la Autónoma de Guadalajara un Parque Tecnológico. (2005, September). *Confluencia*, 141, p. 20.
- Crean nueva vicerrectoría enfocada al desarrollo empresarial [Electronic version]. (2006, May 2). *PANORAMA*, p. INSTITUCIONAL4.
- Crean nuevo concepto en salud. (2006, January 24). *Tecnológico de Monterrey*. Retrieved February 14, 2006 from http://cmportal.itesm.mx/wps/portal!/ut/p/kcxml/04_Sj9SPykssy0xPLMnMz0vM0Y_QjzKLN4i3dAXJgFjGpvqRqCKOcaFfj_zcVKBwpDmQ7-ynH5WTmp6YXKkfrO-tH6BfkBsaUZ7vqAgA4a3jzw!!/delta/base64xml/L0lJsk03dWIDU1EhIS9JRGpBQUV5QUJFUkVSRUlnLzRGR2dkWW5LSjBGUm9YZmcvN18wX0NO?WCM_PORTLET=PC_7_0_CN_WCM&WCM_GLOBAL_CONTEXT=http://cmpublish.itesm.mx/wps/wcm/connect/ITESM/Con%C3%B3cenos/Sala+de+prensa/Boletines+de+prensa/Institucionales/
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, Calif.: Sage Publications.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, Calif. ; London: Sage Publications.
- Dan a conocer nuevo Campus de la Salud [Electronic version]. (2006, January 26). *PANORAMA*, p. Front cover.
- Deben ser universidades las impulsoras del desarrollo [Electronic version]. (2005, November 25). *CRÓNICA INTERCAMPUS*, 21, p. PERFILES.
- Denzin, N. (2001). Strategies of multiple triangulation. In C. F. Conrad, J. G. Haworth, & J. L. Ratcliff (Eds.), *Qualitative Research in Higher Education* (pp. 317-328). Boston, MA: Pearson Custom Publishing.
- Desarrollarán la biotecnología [Electronic version]. (2006, March 23). *PANORAMA*, p. INSTITUCIONAL4.
- DiMaggio, P. J., and Powell, W. W. (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, 147-60.

- Distribuirán conocimiento a hispanoparlantes [Electronic version]. (2006, March 10). *CRÓNICA INTERCAMPUS*, 25, p. ACADÉMICA.
- Drucker, P. F. (1993). *Post-capitalist society* (1st ed.). New York: HarperBusiness.
- Eggers, L. (2005, September 28). Las mejores escuelas de negocios de México. *EXPANSIÓN*, 102-106.
- Ehrenberg, R. G., Rizzo, M. J., & Condie, S.S. (2003). *Start up costs in American research universities* [Working paper 33]. Retrieved March 14, 2007, from <http://www.ilr.cornell.edu/cheri/>
- El Reto hacia el 2015: Generar conocimiento [Electronic version]. (2005, February 24). *PANORAMA*, p. Front cover.
- Elizondo, E. R. (2003). *Cauce y corriente: Sesenta Aniversario*. Monterrey, México: Tecnológico de Monterrey.
- Emerson, R.M. (1962). Power-dependence Relations. *American Sociological Review*, 27(1), pp. 31-41.
- Enfocan investigación al área de la salud [Electronic version]. (2005, November 3). *PANORAMA*, p. ACADÉMICO2.
- Enríquez Cabot, J. (2000). *El reto de México: tecnología y fronteras en el siglo XXI: una propuesta radical*. México: Planeta.
- Esquivel, F. (1988). *Innovación Educativa en el Sistema ITESM*. Monterrey, México: Tecnológico de Monterrey.
- Esquivel, F. (2005). *La investigación del Tecnológico de Monterrey para la competitividad y el bienestar social*. Monterrey, México: Tecnológico de Monterrey.
- Exploran en campos del conocimiento [Electronic version]. (2005, November 10). *PANORAMA*, p. ACADEMICO2.
- Feller, I. (1997). Technology transfer from universities. In *Higher education: Handbook of theory and practice* (Vol. 12, pp. 589-610).
- Florida, R., and Cohen, W.M. (1999). Engine or infrastructure? The university role in economic development. In L.M. Branscomb, F. Kodama, & R. Florida (Eds.), *Industrializing knowledge: University-industry linkages in Japan and the United States* (pp. 589-610). Cambridge, PA: MIT Press.

- Fomentan formación emprendedora en el Sistema Tecnológico. (2005, October). *Confluencia*, 142, p. 18.
- Fomentará CIT2 desarrollo de empresas de Nuevo León basadas en tecnología [Electronic version]. (2006, February 9). *PANORAMA*, p. INSTITUCIONAL4.
- Fortalecerán modelos de gobierno electrónico [Electronic version]. (2006, March 23). *PANORAMA*, p. ACADÉMICO6.
- Francis, J. G., & Hampton, M. C. (1999). Resourceful responses: The adaptive research university and the drive to market. *Journal of Higher Education*, 70(6), 625-641.
- Fulton, O. & Trow, M. (1975). Students and Teachers: Some General Findings of the 1969 Carnegie Commission Survey. In M. Trow (Ed.), *Teachers and Students: Aspects of American Higher Education* (pp. 1-38). New York, NY: McGraw-Hill Book Company.
- Generarán conocimiento en tareas de investigación [Electronic version]. (2006, February 2). *PANORAMA*, p. Front cover.
- Generarán crecimiento con red de incubadoras [Electronic version]. (2007, February 22). *PANORAMA*, pp. ESPECIAL10-11.
- González, P. (2006, April 16). Encuentra Tec negocio en nanorrobótica médica. *Reforma*. Retrieved May 9, 2006 from <http://busquedas.gruporeforma.com/reforma/default.asp>
- Hacia una economía basada en el conocimiento [Electronic version]. (2005, October 6). *PANORAMA*, p. INSTITUCIONAL1.
- Hackett, E. J. (1990). Science as a vocation in the 1990s: The changing organizational culture of academic science. *The Journal of Higher Education*, 61(3), 241-279.
- Hackman, J.D. (1985). Power and centrality in the allocation of resources in colleges and universities. *Administrative Science Quarterly*, 30, 61-77.
- Hawley, A.H. (1968). Ecology. In Sills, D. L. (Ed.), *International Encyclopedia of Social Sciences* (Vol. 4, pp. 328-337). New York: MacMillan.
- Hills, F. S. & Mahoney, T. A. (1978). University Budgets and Organizational Decision Making. *Administrative Science Quarterly*, 23(3), 454-465.
- Ibarra, E. (2002). Capitalismo académico y globalización: la universidad reinventada. *Revista de la Educación Superior*, 122, 147-54.

- IDeSS: Una contribución con el desarrollo humano, social y económico de la comunidad [Electronic version]. (2007, March 15). *PANORAMA*, pp. ESPECIAL10-11.
- Impulsarán calidad en PyMES de software [Electronic version]. (2006, March 30). *PANORAMA*, p. INSTITUCIONAL1.
- Impulsarán investigación EL UNIVERSAL e ITESM. (2005, September 12). *EL UNIVERSAL online*, Retrieved September 23, 2005 from http://www2.eluniversal.com.mx/pls/impreso/noticia.html?id_nota=129396&tabla=INSTITUCIONAL_h
- Inaugura Centros de Incubación de Empresas la Universidad de Guanajuato. (2005, September). *Confluencia*, 141, p. 24.
- Inauguran Centro de Innovación y Transferencia de Tecnología [Electronic version]. (2006, February 10). *CRÓNICA INTERCAMPUS*, 23, p. INSTITUCIONAL.
- Inauguran IDeSS en Jalisco [Electronic version]. (2007, March 8). *PANORAMA*, p. INSTITUCIONAL1.
- INEGI. (2005). *II Conteo de Población y Vivienda 2005*. Retrieved February 19, 2007, from <http://www.inegi.gob.mx/est/contenidos/espanol/proyectos/conteos/conteo2005/default.asp?c=6224>
- Ingres a EGAP a elite de escuelas de administración pública [Electronic version]. (2006, September 28). *PANORAMA*, p. Front cover.
- Innovan con centro de diseño de productos [Electronic version]. (2006, February 16). *PANORAMA*, p. INSTITUCIONAL1.
- Investigación: núcleo del conocimiento hacia el 2015 [Electronic version]. (2005, May 3). *PANORAMA*, p. INSTITUCIONAL1.
- Investigación: un compromiso con el bienestar de la sociedad [Electronic version]. (2007, March 1). *PANORAMA*, p. Front page.
- Jencks, C., & Riesman, D. (1968). *The academic revolution* (1st ed.). Garden City, N.Y.: Doubleday.
- Kennedy, M. M. (1979). Generalizing from single case studies. *Evaluation Quarterly*, 3(4), 661-679.

- Kerr, C. (2001). *The uses of the university* (5th ed.). Cambridge, Mass.; London: Harvard University Press.
- Lancy, D. F. (1992). *Qualitative research in education : An introduction to the major traditions*. White Plains, N.Y.: Longman.
- Lezcano, N. (2005, September 28). Cuando el salón es una empresa: Los MBA locales se acercan cada vez más a las compañías con incubadoras y consultoría. *EXPANSIÓN*, 109-121.
- Lynton, E. A., & Elman, S. E. (1987). *New priorities for the university: Meeting society's needs for applied knowledge and competent individuals* (1st ed.). San Francisco, Calif.: Jossey-Bass.
- Marcan el camino hacia una 'Ciudad del Conocimiento' [Electronic version]. (2005, September 8). *PANORAMA*, p. INSTITUCIONAL4.
- March, J. G. (1962). The business firm as a political coalition. *The Journal of Politics*, 24(4), 662-678.
- Marshall, C., & Rossman, G. B. (1999). *Designing qualitative research* (3rd ed.). Thousand Oaks, Calif.: Sage Publications.
- Martin, J., & Samels, J. E. (2002). The community college baccalaureate: Mission creep or manifest destiny? *Community College Week*, 14(23), 4.
- Más apoyo para contribuir a la generación del bienestar económico [Electronic version]. (2005, October 14). *CRÓNICA INTERCAMPUS*, 20, p. ALTERNATIVAS.
- Mason, J. (1996). *Qualitative researching*. London ; Thousand Oaks, Calif.: Sage.
- Mayor exigencia para cumplir con la Misión [Electronic version]. (2006, February 23). *PANORAMA*, p. Front cover.
- Merriam, S. (2001). Case studies as qualitative research. In C. F. Conrad, J. G. Haworth, & J. L. Ratcliff. *Qualitative research in higher education* (pp. 191-201). Boston: MA.; Pearson Custom Publishing.
- Milem, J. F., Berger, J. B., & Dey, E. L. (2000). Faculty time allocation: A study of change over twenty years. *Journal of Higher Education*, 71(4), 454-475.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis : An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage Publications.

- Morphew, C. C. (2002). "A Rose by Another Name": Which Colleges Became Universities. *The Review of Higher Education*, 25(2), 207-223.
- Newman, F., Couturier, L., & Scurry, J. (2004). *The future of higher education : Rhetoric, reality, and the risks of the market* (1st ed.). San Francisco: Jossey-Bass.
- OECD (Organization for Economic Co-operation and Development). (1996). *The knowledge-based economy in 1996: science, technology and industry outlook*. Paris, OECD.
- OECD (Organization for Economic Co-operation and Development). (2006). *Main Science and Technology Indicators 2006-2*. Retrieved February 18, 2007 from <http://www.oecd.org/dataoecd/49/45/24236156.pdf>
- Pfeffer, J. (1981). *Power in organizations*. Marshfield, Mass.: Pitman Pub.
- Pfeffer, J., & Salancik, G. R. (1974). Organizational decision making as a political process: The case of a university budget. *Administrative Science Quarterly*, 19(2), 135-151.
- Phillips, D.C. (1990). Subjectivity and Objectivity: An Objective Inquiry. In E. W. Eisner & A. Peshkin (Eds.), *Qualitative Inquiry in Education* (pp. 19-37). New York, NY: Teachers College Press.
- Plantean nuevos retos para el Tecnológico de Monterrey. (2006, February 20). *Tecnológico de Monterrey*. Retrieved February 27, 2006 from http://cmportal.itesm.mx/wps/portal!/ut/p/kcxml/04_Sj9SPykssy0xPLMnMz0vM0Y_QjzKLN4i3dAXJgFjGpvqRqCKOcAFfj_zcVKBwpDmQ7-ynH5WTmp6YXKkfrO-tH6BfkBsaUZ7vqAgA4a3jzw!//delta/base64xml/L0IJSk03dWIDU1EhIS9JRGpBQUV5QUJFUkVSRUlnLzRGR2dkWW5LSjBGUm9YZmcvN18wX0NO?WCM_PORTLET=PC_7_0_CN_WCM&WCM_GLOBAL_CONTEXT=http://cmpublish.itesm.mx/wps/wcm/connect/ITESM/Con%C3%B3cenos/Sala+de+prensa/Boletines+de+prensa/Institucionales/
- Por el futuro de México: nos exigimos ser mejores [Electronic version]. (2005, October 14). *CRÓNICA INTERCAMPUS*, 20, p. ENFOQUE.
- Powers, J. B. (2006). Patents and royalties. In Priest, D. M., & St. John, E. P. (Eds.), *Privatization and public universities* (pp. 129-150). Bloomington, IN: Indiana University Press.
- Premian impulso en la creación de empresas [Electronic version]. (2005, October 13). *PANORAMA*, p. INSTITUCIONAL1.

- Promoverán innovación y creación de empresas [Electronic version]. (2006, Abril 20). *PANORAMA*, p. Front cover.
- Promoverán transferencia de conocimiento en todo el país [Electronic version]. (2005, September 1). *PANORAMA*, p. INSTITUCIONAL1.
- Publicaciones reciben impulso [Electronic version]. (2005, October 14). *CRÓNICA INTERCAMPUS*, 20, p. PUBLICACIONES.
- Rangel, S. R. (2005). Como seguir siendo competitivos. In González-Aréchiga, B. (Ed.), *Hacia un desarrollo basado en el conocimiento* (pp. 29-46). Monterrey, México: Tecnológico de Monterrey. Retrieved August 25, 2006, from http://www.itesm.mx/egap/que_es_egap/inv_pub/home.html
- Rangel, S. R. (2006). *El Tecnológico de Monterrey como promotor del desarrollo del país* [DVD]. Monterrey, México: Tecnológico de Monterrey.
- Riesman, D. (1956). *The academic procession: Constraint and variety in American higher education*. Lincoln, NE: University of Nebraska Press.
- Rhoades, G. (1992). Organization Theory. In Clark, B.R., & Neave, G.R. (Eds.), *The Encyclopedia of Higher Education* (Vol. 3, pp. 1884-1896). Oxford, NY: Pergamon Press.
- Rhoades, G., & Slaughter, S. (1997). Academic capitalism, managed professionals, and supply-side higher education. *Social Text*, (51, Academic Labor), 9-38.
- Robles, P. H., Molina, O. A., & Fuentes, B. R. (2005). *La Economía basada en el Conocimiento: Las Condiciones de los Estados Mexicanos*. Monterrey, México: Tecnológico de Monterrey.
- Rubin, H. J., & Rubin, I. (1995). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, Calif.: Sage Publications.
- Salancik, G. R., & Pfeffer, J. (1974). The bases and use of power in organizational decision making: The case of a university. *Administrative Science Quarterly*, 19(4), 453-473.
- Scott, W.R. (2001). *Institutions and Organizations*. Thousand Oaks, Calif.: Sage Publications.
- Selingo, J. (2000). Facing new missions and rivals, state colleges seek a makeover. *Chronicle of Higher Education*, 47(12).

- Selingo, J. (2002). Mission creep? *Chronicle of Higher Education*, 48(38)
- SEP (Secretaría de Educación Pública). (2003). *Informe Nacional sobre la Educación Superior en México*. Retrieved February 18, 2007 from http://www.sep.gob.mx/wb2/sep/sep_Educacion_Superior
- Slaughter, S. (1993). Retrenchment in the 1980s. *Journal of Higher Education*, 64(3), 250-282.
- Slaughter, S., & Leslie, L. L. (1997). *Academic Capitalism: Politics, Policies, and the Entrepreneurial University*. Baltimore, MD.: The John Hopkins University Press.
- Slaughter, S., & Rhoades, G. (1996). The emergence of a competitiveness research and development policy coalition and the commercialization of academic science and technology. *Science, Technology, and Human Values*, 21(3), 303-339.
- Slaughter, S., & Rhoades, G. (2004). *Academic Capitalism and the New Economy: Markets, State, and Higher Education*. Baltimore, MD.: The John Hopkins University Press.
- Son universidades motor de cambios sociales [Electronic version]. (2005, February 24). *PANORAMA*, p. 7.
- Stage, F. K., & Manning, K. (2003). *Research in the college context: Approaches and methods*. New York ; Hove England: Brunner-Routledge.
- Stake, R. E. (1978). The case study method in social inquiry. *Educational Researcher*, 7(2), 5-8.
- Suchman, M. C. (1995). Managing Legitimacy: Strategic and Institutional Approaches. *The Academic of Management Review*, 20(3), 571-610.
- Tecnológico de Monterrey. (1996). *Mission of the Monterrey Institute of Technology University System: Towards 2005* [brochure]. Monterrey, México: Tecnológico de Monterrey.
- Tecnológico de Monterrey. (2005a). *Principles*. Monterrey, México: Tecnológico de Monterrey. Retrieved february 14, 2007 from <http://www.itesm.mx/2015/english/resources.html>.
- Tecnológico de Monterrey. (2005b). *Visión Misión 2015* [brochure]. Monterrey, México: Tecnológico de Monterrey.

- Tecnológico de Monterrey. (2006). *Informe anual 2005*. Monterrey, México: Tecnológico de Monterrey.
- Tecnológico de Monterrey. (2007). *Informe anual 2006*. Monterrey, México: Tecnológico de Monterrey.
- Tolbert, P. S. (1985). Institutional environments and resource dependence: Sources of administrative structure in institutions of higher education. *Administrative Science Quarterly*, 30(1), 1-13.
- Torres, C. A., & Schugurensky, D. (2002). The political economy of higher education in the era of neoliberal globalization: Latin America in comparative perspective. *Higher Education*, 43(4), 429-455.
- Trabajarán en sinergia por el medio ambiente [Electronic version]. (2005, October 20). *PANORAMA*, p. ACADÉMICO6.
- Transfieren conocimiento a empresas tecnológicas [Electronic version]. (2005, October 27). *PANORAMA*, p. ACADÉMICO2.
- Transfieren conocimiento para impulso tecnológico [Electronic version]. (2006, February 16). *PANORAMA*, p. Front cover.
- Trow, M. (1973). Problems in the Transition from Elite to Mass Higher Education. *Policies for Higher Education*. Paris: OECD, pp. 51-101.
- Trow, M. (1984). The analysis of status. In B. R. Clark (Ed), *Perspectives on Higher Education: Eight disciplinary and comparative views*. Los Angeles, CA, USA: University of California Press.
- Un nuevo reto [Electronic version]. (2007, March 2). *Piensa Índigo*, p. FRONT COVER.
- Volk, C. S., Slaughter, S., & Thomas, S. L. (2001). Models of institutional resource allocation: Mission, market, and gender. *Journal of Higher Education*, 72(4), 387-413.
- Walker, K. P. (2001). Opening the door to the baccalaureate degree. *Community College Review*, 29(2), 18.
- Wattenbarger, J. (2000). Colleges should stick to what they do best. *Community College Week*, 12(18), 4.
- Weiss, R. (1994). *Learning from strangers. The art and methods of qualitative interview studies*. New York/Oxford/Singapore: The Free Press/Maxwell Macmillan.

- Wengraf, T. (2001). *Qualitative research interviewing : Biographic narrative and semi-structured methods*. London ; Thousand Oaks, Calif.: Sage.
- Winston, G. C. (1999). Subsidies, hierarchy and peers: The awkward economics of higher education. *The Journal of Economic Perspectives*, 13(1), 13-36.
- Whitt, E. J. (2001). Document Analysis. In C. F. Conrad, J. G. Haworth, & J. L. Ratcliff (Eds.), *Qualitative Research in Higher Education* (pp. 447-454). Boston, MA: Pearson Custom Publishing.
- Wolcott, H. (1987). On ethnographic intent. In Spindler, G. & Spindler, L. (Ed.), *Interpretive ethnography of education. At home and abroad* (pp. 36-57). Hillsdale, New Jersey/London: Lawrence Erlbaum Associates.
- Wofle, D. L. (1972). *The home of science; the role of the university*. New York: McGraw-Hill.
- World Bank. 2002. The changing nexus: Tertiary education institutions, the marketplace, and the state, in *Constructing knowledge societies: New challenges for tertiary education*. Washington, D.C.: The World Bank. pp. 67-97.
- Yin, R. K. (1989). *Case study research: Design and methods* (Rev. ed.). Newbury Park, CA: Sage Publications.