



UNIVERSIDAD DE QUINTANA ROO

División de Ciencias Políticas y Humanidades

**Effects of Personal Factors on Professors'  
Productivity: A Case Study**

TESIS

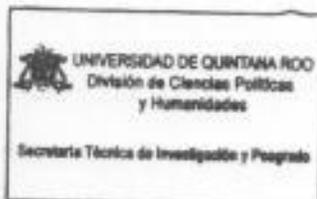
Para obtener el grado de

**MAESTRÍA EN EDUCACIÓN**

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Chetumal, Quintana Roo, México, Julio 2015.





División de Ciencias Políticas y Humanidades

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Tesis elaborada bajo la supervisión del Comité de tesis del programa de  
Maestría y aprobada como requisito para obtener el grado de:

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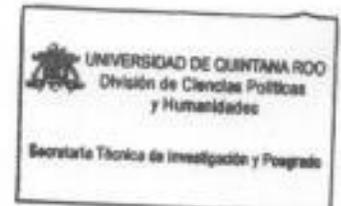
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## **DEDICATION**

First at all, I dedicate this thesis to my father Juan Castañeda Jimenez (+) who has been my inspiration for all my academic achievements and who taught me to believe in hard work. I also dedicate this thesis to my daughter Johanna Campos Castañeda, who has been my motivation through this process, and my beloved parents, my mother Doris González Balam and my father Manuel Atocha Viana Loeza whose words of encouragement and their support have enriched my life.

Besides, a special feeling of gratitude to my partner Gilberto Campos Valdéz who has supported me throughout all this process and without his love, wisdom and generosity, this would not have happened.

Finally, I dedicate this work and give special thanks to my brother Geovanny de la Cruz Castañeda González and his family, and my aunt Francisca González Balam; I will always appreciate all they have done for me.

## **ACKNOWLEDGEMENTS**

I would like to express a huge gratitude to my advisor. Edith Hernández Méndez for her support, guidance, understanding, encouragement but, above all her patience throughout my study and research. Without her patience, time and advice, my thesis work would have not been possible.

In addition, I would also like to express my appreciation to María del Rosario Reyes, Moisés Perales Escudero, Rosa Isela Sandoval Cruz and Lizbeth Gómez Argüelles for being members of my thesis committee. Their thoughtful comments on my work were greatly valued.

Thanks also go to my classmates at the University of Quintana Roo who helped me through this academic exploration.

Finally I would like to thank my parents for their unconditional love and support during the last two years; I would not have been able to complete this thesis without their continuous love and encouragement.

## ABSTRACT

The purpose of this study was to find out how some personal factors affect research productivity. Participants of this study were five faculty members who work in the Department of Language and Education at the University of Quintana Roo. They were selected in a purposely way. Qualitative research methodology was adopted and a case study was used to come up with the results of this study. Data were collected through semi-structured interviews and analyzed with the software Atlas Ti. The professors' productivity was measured considering the number of articles, books, book chapters and proceedings. This study was framed within the Social Cognitive Theory of Albert Bandura, which focuses on how certain factors influence the development and changes of behaviors. The results showed that age did not have an important effect on productivity, but experience did. Regarding sex, there was no evidence that showed differences on productivity between men and women. What is more, marital status was a factor which did not seem to affect productivity either. Interestingly, the number of children was the major cause of low productivity. Although, sex, age, marital status and number of children were addressed in this study, the institutional context plays an important role because it seems to have strong effects on productivity.

**Keywords:** Research activity, productivity, productivity measurement, personal factors.

## TABLE OF CONTENTS

DEDICATION .....	I
ACKNOWLEDGEMENTS .....	II
ABSTRACT.....	III
LIST OF FIGURES .....	VI
LIST OF TABLES.....	VI
INTRODUCTION .....	1
CHAPTER 1: LITERATURE REVIEW.....	9
1.1 Definitions of the dimensions.....	9
1.1.1 Research activity.....	9
1.1.2 Productivity.....	10
1.1.3 Productivity Measurement.....	11
1.1.4 Personal factors.....	14
1.2 Literature Review.....	15
1.2.1 Research Activity.....	16
1.2.2 Productivity.....	21
1.2.3 Factors affecting productivity.....	23
CHAPTER 2: THEORETICAL FRAMEWORK.....	34
2.1 Social Cognitive Theory of Albert Bandura.....	34
2.1.1 Reciprocal determinism.....	35
2.1.2 Environmental factors.....	36
2.1.3 Self-efficacy.....	38
2.1.4 Self-regulation.....	43

CHAPTER 3: RESEARCH METHOD.....45

    3.1 Methodological Approach.....45

        3.1.1 Case Study Design.....46

        3.1.2 Context.....47

        3.1.3 Subjects of the Study.....49

        3.1.4 Sample.....50

        3.1.5 Data Collection Procedures.....50

        3.1.6 Instruments.....52

        3.1.7 Data Analysis Procedure.....54

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION OF THE DATA.....58

    4.1 Data Analysis and results.....58

        4.1.1 Research question 1: What are the full-time professors' personal characteristics (sex, age, marital status, number of children, academic rank, education, participation in programs, administrative appointments and time of experience doing research) in the department of languages and education at University of Quintana Roo?.....58

        4.1.2 Research question 2: What is the research productivity level of the professors? .....60

        4.1.3 Research question 3: How age, sex, marital status and number of children affect productivity and what interactions can be found among them?.....62

    4.2. Interpretation of the data.....72

CHAPTER 5: CONCLUSIONS.....76

REFERENCES.....80

## LIST OF FIGURES

<b>Figure</b>		<b>Page</b>
1.	Personal Factors Affecting Research	15
2.	Productivity..... Model of factors that influence behavior adapted from Bandura's	35
3.	theory.....	55
4.	Data Analysis in qualitative research model..... Factors affecting productivity adapted from Bandura's model.....	72

## LIST OF TABLES

<b>Table</b>		<b>Page</b>
1.	Literature review of the factors affecting productivity (Gonzalez, 2005).....	25
2.	Characteristics of the professors.....	58
3.	..	59
4.	Academic data of the Professors.	61
5.	.....	62

Professors'

Productivity.....

Simplified professors' productivity

chart.....

## INTRODUCTION

Universities around the world recognize research activity as an important part of their faculty's responsibilities. Generating knowledge through research has been considered an expected behavior within the academic community in Higher Education Institutions' initiatives. Furthermore, researchers are seen as a prestigious element in society. At many universities around the world, faculties have as one of their priorities the academic productivity (Akerlind, 2008; Rice and Sancho, 2001; Sánchez, Zavala & Carrillo, 2010).

Several studies regarding this topic have been carried out in different contexts around the world; studies begin with Brindley (1991), a study of research engagement, and continue with similar works by Borg (2006); Allison and Carey (2007); and Salazar and Almonte (2008). They found that research activity requires time and sometimes the time consumed in teaching leaves little space or energy for conducting research or carrying a project to completion and publication.

Research requires a constant effort and the employment of academic strategies. These requirements may be challenging for some novice teachers interested in the research field. Some academic strategies can refer to the management of information; for example, the use of online search engines, or database management. Besides being able to look for and handle information, researchers should have good writing skills, time management skills and background knowledge about research methodologies.

In addition to the use of academic strategies, researchers may need to be part of a consolidating group of research; they may need to look for financial funding, and, of course, publish. What is more, they may need to cover other faculty functions, such as:

teaching, administrative appointments or meetings and administration (Brindley, 1991; Berstain, 1999; Linares, 2002).

The research activity process started in Europe as a response to the changes and demands of the Industrial Revolution. Because of its success in Europe, new policies regarding research activity were established there and spread in Latin American universities. Over the last two decades, many Mexican universities, especially public ones, have also undertaken research as one of their main activities implementing the policies developed in Europe. Research is context-related, thus Mexican universities acquire specific features which are quite different from the ones found in European and North American universities (Chavoya, 2001).

In the nineties, in Mexican universities, teaching was the main function and the center of attention of faculty members (Sanchez, 1988). Recently, however, due to the fact of public policies, research activity constitutes an aim for excellence (Galaz and Gil, 2009). Thus, research has become a more relevant role over teaching (Canales, 2011). In the past, professors used to solely teach their classes but now, they are also required to do research (Estévez, 2007; Galaz and Gil, 2009), besides having to fulfill other compulsory functions. Doubtless, there has been a shift in the academic functions of faculty members in Mexican universities.

There are some studies (Pacheco, 1987; Sánchez, 1988; Ibarra, 2002; Leyva, Galaz and Gil, 2009) in the context of Mexico that have examined research as a new function into the universities. Other studies (Escalante and Ibarra, 2002; Ordorika et.al, 2007; and Ramirez, 2009) have examined the importance of taking into account some factors which could affect research activity; for example, gender, motherhood, teacher

training (experience), lack of financial funding and infrastructure, or lack of good working conditions.

Mexican universities have started to work with different measurements such as the professional development, the consolidation of academic research groups, teacher's education, funding sources, research abilities, and incentives to conduct research. Some of these measurements have increased and stimulated the professors' productivity by providing federal financial funding, giving support, forming research groups and awarding scholarships. Mexican entities such as CONACyT (The National Council of Science and Technology) are in charge of establishing government policies for scientific and technological activities. Nowadays Mexican higher education faculty has to follow and fulfills the requirements of such policies. These Mexican government entities also grant scholarships for graduate studies or provide economic stimulus for those professors whose research productivity is outstanding. There is another important Mexican program as part of CONACyT, SNI (The National System of Researchers). It has been one of the most important federal government instruments to encourage academic faculty permanence as well as to evaluate research quality. In 1998, SNI had registered 6742 researchers, and at the end of January 2010, there were 16, 598 researchers (ANUIES, 2004, 2010). As it can be observed, there has been an increase of researchers in Mexico.

ANUIES (The National Association of Universities and Higher Education Institutions) is a non-governmental organization which is involved in the development of national policies, programs and plans for universities. It also establishes agencies aimed at fostering the development of higher education.

PROMEP (the Faculty Development Program), a program of the Ministry of Education, has as objectives the qualification levels of full-time faculty members in public institutions and the development of academic groups of research. This entity has the capacity to undertake relevant research and disseminate innovations (Brunner, Santiago, García, Gerlach and Velho, 2008). As part of the incentives of PROMEP, there is a Productivity Program (in Spanish “Carrera Docente”) whose main purpose is to stimulate teaching development of professors in Mexican public universities as well as other functions.

Thus, in general most of these entities initiatives privilege and stimulate research activity but underestimate teaching (Vaquero, 2005; Guzman and Trujillo and Canales, 2011). Unlike decades ago, today universities actively participate to generate knowledge through research because some public universities have implemented and promoted these policies to foster research, and more faculty members are getting involved in this recent activity.

Even though universities promote policies for research, not all professors participate in these programs because not all the policies are compulsory. These have been useful as incentives and have made an important change in higher education institutions and universities in Mexico (Chavoya, 2001 and Canales, 2011).

Not only institutions play an important role in professors’ productivity, but also other variables are important to take into account (Issaksson and Lindberg, 2012). Chavoya and Noriega (2001) pointed out that the discipline or field and the context are important features which help to shape the academic work in the institutions. Disciplines have been the focus of attention to investigate academic cultures and behaviors.

In Mexico, Leyva (2009) points out that disciplines help to identify which areas (fields) foster more research activity. For example, it has been shown that there is a lot of research in certain disciplines like engineering and health, natural and pure sciences; and there is a low rate of publishing (26%) in humanities and social sciences field (Ordorika et.al, 2007). In past times, research practice was more common for hard sciences but now it is common also in social sciences and the humanities (Blackmore, Brennan (2006) and Zipin, 2010). In the case of the modern languages field, which is the interest of this thesis, Ramirez (2009) and Felix (2011) reported that the discipline plays an important and decisive role in activities carried out by faculty members and they give evidence of the need to consider discipline in the study of professors' productivity.

In spite of the fact that research activity at universities has been a prolific topic in European countries, it is still scarce in the context of Mexico and specifically in the modern languages field. Some studies (Bell and Seater, 1980; Braxton and Bayer, 1986; Clark & Lewis, 1985; Creswell, 1986; Levin & Stephan, 1989; Lewis and Becker, 1979; Tien and Blackburn, 1996) have addressed personal factors and their effects on professors' productivity. Additionally, the majority of the studies have been conducted under a quantitative approach ignoring in some cases personal factors such as age, gender and marital status. Consequently, there is a gap in the literature regarding this topic. Therefore, there is a need to conduct studies in the field of modern languages about personal factors that can affect research productivity.

Professors that do research have specific characteristics and it has been observed by previous authors (Dundar and Lewis, 1988; Prpic, 2002; Stack, 2004; Fox, 2005;

Abramo, D'angelo and Caprasecca, 2009). Some professors do not have the same experiences when they do research as other colleagues in different disciplines or even in the same field.. Professors experiment research in different ways depending on personal factors and according to the context they are surrounded by. Unless we understand variations in research productivity across different personal factors and how they could affect in a different way, we will be able to assess and correct existing differences and inequities in the structure of faculty work and rewards (Fox, 2005).

As far as I know, there are no similar studies regarding the personal factors that affect research productivity in the foreign languages field in Quintana Roo. Therefore, the primary aim of this study is to investigate the effects of some personal factors (sex, age, marital status and number of children) on professors' productivity in the foreign language field at the University of Quintana Roo. The objectives that guided this study are the following:

- a) To identify the professors' personal factors.
- b) To establish the professors' research productivity level.
- c) To examine how some personal factors (sex, age, marital status and number of children) affect the professors' productivity and how they interact among themselves.

For this study, the following three questions were addressed:

1. What are the full-time professors' personal factors (sex, age, marital status, number of children, academic rank, education, participation in programs,

administrative appointments and time of experience doing research) in the Department of Language and Education at University of Quintana Roo?

2. What is the professors' research productivity level?
3. How age, sex, marital status and number of children affect productivity and what interactions can be found among themselves?

This study is expected to contribute to a better understanding of professors' productivity. Besides, participants in this study would be more assertive by knowing these new data about how some personal factors and what is happening in their academic work, especially regarding their productivity. They can know their perceptions about productivity and they could maximize their research skills and productivity development. They can benefit and become more efficient if they know how these factors can affect their productivity.

Furthermore, scholars who desire to investigate about this matter might directly benefit from this research. Even other departments could benefit by knowing the reality of the productivity of the professors at this university. The University of Quintana Roo itself, an institution recognized nationally for including research as an important function of its professors, may also benefit from the information provided in this research because this work may contribute to other related investigations or it may develop research studies and projects related to the matter.

Finally, policymakers, policy experts or research advisors and tutors could have part of the panorama considering these factors where the scientific community is relatively small. This thesis could allow these authorities to access the real necessities and challenges of professors.

This thesis consists of five chapters (1. Literature review, 2. Theoretical framework, 3. Research method, 4. Data analysis and interpretation of the data and 5. Conclusions). Following this introduction, chapter one reviews the literature on the topic of the dissertation from a variety of perspectives; it goes over how research activity and productivity represents a new trend in Mexican universities, and reviews some major findings from empirical research studies concerning the factors affecting productivity.

# CHAPTER 1

## LITERATURE REVIEW

This chapter is organized in the following way: Firstly, it is presented the definition of the dimensions to be investigated in this study: research activity, productivity, productivity measurement and personal factors. Secondly, the studies related to these dimensions are reported in a literature review: research activity, productivity and factors which affect productivity.

### 1.1 Definitions of the dimensions

In the case of the terms *productivity* and *research activity*, sometimes we find some misunderstandings to distinguish one from the other. They are seen as the same, however, there are differences between the two. Even though *research activity* is not the focus in this work, it is worth mentioning that is also used through the thesis, due to the fact that the term is used in the majority of the studies presented in the literature. So, it cannot be overlooked. The definition of both terms are presented in the following lines.

#### 1.1.1 Research activity

According to COLCIENCIAS (1982), research activity refers to all the activities related to production; for instance, to generate knowledge of research or to generate scientific issues, to participate in research projects, to attend to scientific events, to take courses, to organize scientific events, to teach in postgraduate level, to train new researchers, to do outreach activities, tutorships, consultancies and theses reviews and assessments. Okafor (2005) defines research activity as a human activity based on

intellectual application in the investigation. The objective of research activity is to discover and to develop of methods for the advancement of human knowledge.

### **1.1.2 Productivity**

*Productivity*, from an economic perspective, means a relation between supplies and product. According to the Wikipedia encyclopedia (2013), *productivity* is the ratio of output to inputs in production; it is a measure of the efficiency of production. Productivity has many benefits. At the national level, productivity growth raises living standards because more real income improves people's ability to purchase goods and services, enjoy leisure, improve housing and education and contribute to social and environmental programs. The Oxford Advanced Learner's Dictionary (2011) defines it as the rate at which a worker, a company or a country produces goods, and the amount produced, compared with how much time, work and money is needed to produce them.

*Productivity* in research refers to a relation between the research activities that university professors carry out and the results they produce through research activities. We can also find other definitions of productivity in this regard. For instance, Layzell (1996) defines it as the way in which a firm transforms inputs into outputs (e.g. labor and capital). Johnstone (1993) says *productivity* is related to the input of faculty and staff not to enrollments or to courses taught or to credit or classrooms hours assigned, but to learning (the demonstrated mastery of a defined body of knowledge of skills). Levin (1992) defines *productivity* as an increase in educational outcomes relative to costs or lower costs for a given set of educational outcomes. Masy and Wilger (1995) state that the economist sees productivity as the ratio of outputs to inputs. Okafor (2011) uses the term *research output* to refer to productivity as a means by which the academic staff provide

the existing body of knowledge with their own knowledge. This contribution can take the form of journal articles, technical reports, books, book chapters, supervision and training of students. The more research outcome is published in all formats, the more the probability of availability and access to information is assured. Rosser and Mamiseishvili (2011) use the term *faculty productivity* and to measure it they used: (1) number of articles; (2) number of books, reports, books reviews and chapters and (3) presentations and performance or exhibitions.

In this thesis, the term *productivity* refers to the production of tangible results that a research professor generates through research activity. The productivity parameters indicators in this thesis are: books, book chapters, articles and proceedings. In some cases through this work, the term *productivity* can be used interchangeably with the terms *research productivity*, *research output* or *research outcome*. All of them refer to the definition of productivity used in this work. They mean the generated products and the obtained results by the professors who do research.

### **1.1.3 Productivity Measurement**

Productivity measurement has been the object of many different studies in which authors have taken into account different parameters indicators. What is true is that productivity is most often measured in terms of output or outcomes (books, chapters of books, research groups, number of publications, conferences, presentations, grants and so on) that faculty members produce with their research work (Allen, 1997; Blackburn & Lawrence, 1995; Fairweather, 1997, 2002, 2005; Fox, 2005; Michelangeli, 2005; Massy & Wilger, 1995; Meyer, 1998; Middaugh, 2001; Porter & Umbach, 2001; Presley & Engelbride, 1998; Townsend & Rosser, 2007).

Besides, there are various ways of bibliometric studies involving research output in which this is evaluated and monitored at different levels and for different purposes. Hertzal (2003) sets forth that a bibliometric analysis is a descriptive productivity counting which also involves time periods, countries, institutions, and disciplines where productivity outcomes were carried out. The quantity of research output could be observed, according to Naim & Olivastro (1994) and Jacobs (1998), by counting the number of books published and papers produced over a period. In some others works is taken into account the number of postgraduate students under the supervision of each professor or the training of young researchers, which is one of the criteria for awarding distinction into the scientific research (Arenas and Vallas, 2000).

To calculate the productivity of the five participants in this investigation, the number of books, chapters of books, articles and proceedings were considered as the elements or parameters to measure the research output. The criteria were based from a study of Jimenez de Vargas (1992) in which research outcome is the result of the tangible research, it means, the number of publications. A numerical value was assigned to the different types of publications.

Proceedings= .5

Chapters of books= 1

Books= 1.5

Articles= 2

Considering this scale, different number values were assigned to the different types of publications. It is observed that articles have the highest value whereas

proceedings have the lowest. This is due to the fact that some publications fulfill more requirements than others; for example, articles and books are filtered in many ways and they fulfill more academic requirements.

The publications were multiplied by 1 if the publication is national or 2 if the publication is international. The following formula was used to measure research productivity:

$$P = ((PuV \times n) \times 1/2)$$

P: Total of Productivity

PuV: Value according to the publication (Proceedings .5, Chapters of books 1, books 1.5, articles 2)

n: Number of times of the publication

1: One point if the publication is national

2: Two points if the publication is international

The result of this equation, as well as the other components in itself, will be measured as numerical value of total points. To calculate the productivity (P) five elements were considered, then they were assigned a value and then it was multiplied by the “n” times it occurs, finally the result was multiplied by 1 or 2 depending if it is national (1) or international (2). The sum of this was considered as the result of production (productivity).

#### **1.1.4 Personal factors**

Personal factors play an important role in affecting behaviors. According to the Health Promotion Model, personal factors are categorized as either biological (age), psychological (self-esteem and self-motivation) or sociocultural (ethnicity and education) (Pender et al., 2002). Hamburg (1968) and Hinde (1979) mention a list of concepts that they consider as personal factors: occupation, age, economic condition, lifestyle and personality. What is important to mention is that personal factors will vary according to the individuals. Each person has his/her own characteristics (Aguirre, 2000; Bower, 2002; Fraser & Hodge, 2000 and Rosser, 2004).

In this thesis, the personal factors analyzed were sex, age, marital status and number of children. The first factor, sex, includes two groups: female and male. Age refers to the number of years each person has lived. Marital status indicates whether the person is married or single. Finally the number of children refers to the number of dependent children that each professor has. Other factors that could be worth mentioning are academic rank represented by two categories: full professor and associate; and education that covers: master's or doctoral studies. Peña and Lillo (.n.d) put forward that education explains the most the productivity of professors.

The following conceptual model is presented to understand how these personal factors affect research productivity. This conceptual model was adapted from a study of Rosser and Mamiseishvili (2011).



**Figure 1.** Personal Factors Affecting Research Productivity.

As it can be observed in the model, personal factors have an impact on research output; an impact which can be reflected in the productivity of the professors (articles, books, chapters of books and proceedings).

## **1.2 Literature Review**

This chapter reviews the literature associated with the main areas of interest of this study. These areas are: firstly, research activity; second, productivity; and finally, research studies concerned with factors affecting productivity. This literature review provides the background to fully understand the context of this study and also why it was worth doing.

The first section identifies the literature related to productivity and different perspectives. The second section presents previous studies about the research activity and how this topic is addressed in different works. Finally, personal factors affecting productivity are considered from different perspectives and some empirical studies regarding this topic are also considered in this part.

### **1.2.1 Research Activity**

As it was mentioned before, research activity is a more extended definition because refers to the process whereas productivity is the results that professors produce through it. In this thesis I focus on the productivity since the aim is to know how the outcomes (articles, books, chapters of books and proceedings) of the professors are affected by certain factors. Nevertheless, studies about research activity can shed light on interpreting the results of this study. For that reason, some studies that may be considered relevant are also included.

In Canada, Desmond and Carey (2007) explored how professors perceive the actual and possible relationship between their professional practice and research. The participants were fifty five professors. In this study, an open-ended questionnaire and a follow-up discussion were used. The results were that most respondents mentioned there was a lack of time that limits the research activity. Teaching demanded so much time that it left a little space or energy for conducting systematic research or little space to carry out a project for publication. Teachers need some external motivator to do research and to follow a specific project. Some of the teachers who were interviewed mentioned they had a lack of confidence in their research methodology to complete their projects. They also felt competent to handle literature reviews, but not to manage a complete research project.

Contreras (2006) carried out an exploratory study in Chile. The aim of the study was to identify some elements that could affect the professors' research activities at university for example the satisfaction level and the perceptions of professors regarding social conditions. The participants were fifty three professors. The results showed that the

majority of professors were satisfied working and doing their research activities at college. The socioeconomic factors had influenced on professors' beliefs, curricular elements, contents, methodologies and personal characteristics.

Sogi and Perales (2001) conducted a qualitative study at the San Marcos University of Medicine in Peru. Their aim was to describe the daily work of researchers in order to understand their performance and their interactions in the university environment. The participants were forty-two key informants (range 38-83 years), who were interviewed. The results showed that researchers had begun scientific activity in undergraduate as well as postgraduate levels and the study also described how these researchers started doing research. This study did not show the highest frequency to start doing research. However, it mentioned the time constraints that professors pointed out as one of the difficulties when doing research. Finally, this study demonstrated that professors struggle with the amount of teaching hours and research hours; there is no a balance between teaching and research.

Robertson and Bond (2001) explored how academics experience teaching and research and their interrelation in a higher institution of New Zealand. Nine faculty members were interviewed. The semi-structured interviews were designed to explore participants' understandings of research and teaching. The results showed that faculty expressed strong views of the teaching and research relationship. There was a substantial variation in academics' experiences of the meaning of this relationship (teaching and research).

Chavoya (2001) analyzed in a case study some features of the academic work organization and the academic cultures of two groups of researchers at the University of

Guadalajara. The study focused on the influence of discipline, university and context in academic organization. The participants were two research groups, who were interviewed and observed. The results were that the academic culture played an important role into the construction and legitimization of the beliefs and significance of the academic work. Similarly, Leyva (2009) conducted a quantitative study in the University of Sonora, Hermosillo. The study's aim was to describe how professors perceive research activity. The participants were full-time professors. Questionnaires were administered with fifty three items to them. The majority of the professors answered that they did a lot of research. However, when they were asked directly, the 75% of professors answered they have done research during last year. In addition, it was observed that research productivity was quite similar between men and women; however, women gave least priority to the research into their activities. In general, professors in the University of Sonora consider research an important activity in their institution.

Preciado, Gómez and Kral (2008) carried out a qualitative analysis about the professors' experiences at a Mexican University as professors met the requirements of PROMEP<sup>1</sup>. The study focused on how this program has affected teachers' work, the multiplication of tasks, and the evaluation process for obtaining a desirable profile. Mainly, female teachers must combine full-time work such as teaching, research and tutoring. The participants were professors between thirty three and sixty two years old; they have

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<sup>1</sup> PROMEP is a Faculty Development Program which has as one objective the qualification levels of full-time faculty in public institutions; and the development of academic research groups with the capacity to undertake relevant research and disseminate innovations

been working in the institution from around five to twenty six years. For gathering the data, fifteen recorded interviews were used. The results showed that the policies had a clear impact on the research activity in higher education. The authors concluded that research organizations of universities were designed just for men because women had to deal daily with the university measurements and policies trying to earn a better salary. The challenge is to have a balance among all the professors' tasks but the requirements demands a large amount of work.

Rosser and Mamiseishvili (2011) carried out a study in the University of Arkansas to examine and measure the faculty productivity in areas of research, teaching and service related to their job satisfaction at universities. In this study, the NSOPF:04 (the most recent large-scale secondary data set of faculty available) survey was designed to collect information. Scholarly productivity was measured as (1) the number of articles in refereed and non-refereed journals; (2) the number of books, reports, book reviews, and chapters; and (3) the number of presentations and performances or exhibitions. On each of these variables, faculty members reported the number of scholarly outputs from the past two years. The findings from this study indicated that teaching and service was significantly and negatively related to faculty job satisfaction. Higher education institutions need to rethink their rewards structures, value systems and expectations in order to keep productive faculty members who are satisfied with the jobs and provide workplace more appealing and attractive for them.

The research productivity reveals that academics face growing demands that make it harder for professors to achieve the balance among various functions. Faculty members struggle to balance their teaching hours with the high institutional demands of doing

research work. The study also showed that the research activity vary by their demographic characteristics. For example, female professors were more likely than their male counterparts to be more involved in teaching and service and less engaged in research (Allen, 1997; Bellas & Toutkoushian, 1999; Fox, 2005; Park, 1996; Sax et al., 2002; Toutkoushian & Conley, 2005; Xie & Shauman, 1998).

Feixas (2004) carried out a study whose aim was to know the professors' pedagogical orientation and the elements that affect their professional work such as personal, professional, contextual and social factors. The participants were 253 professors from the University of Barcelona and University of Catalunya. For this work, three different instruments were used: a questionnaire, interviews, and document analyses. The selection of professors were in function to teaching orientation and age, gender, teaching experience, and professional level. The results show that professors have more confidence when they have experience, daily practice, personal, professional and teacher maturity to contribute to the change. Also, they have more confidence when they have contact with other experienced professors, and help novice ones to solve their doubts. There are many good professors with different characteristics who can deal with the same situations. The importance of research is to learn research models and gain experience. Furthermore, family and friend relationships are important in the development of the professor. A 53% of professors said they work in a coordinated way with their colleagues. The professors have a good work environment in their institutions. Finally, they underlined the auto-evaluation and reflection is important because they help to the improve teaching.

As we can observe, institutions around the world have shown quite clearly that there is a great variety of ways in which research activity is experienced by professors working in different institutions and in different contexts. There are important variables that can affect the quality of research. Researchers have examined a wide range of factors influencing the research activity. However, it is evident that it is needed a more thorough analysis to understand the factors that influence productivity.

### **1.2.2 Productivity**

Research productivity has received a great amount of attention and concern. Productivity studies in higher education have become more important since the early 1970's. Next some studies, which focus on productivity are presented. They have different perspectives and of course, different aims.

García-Cepero (2010) proposed the use of a technique called "Confirmatory Factor Analysis" as a new approach to solve the faculty productivity measurement problem. The participants were 513 professors in the field of psychology in Chile. Based on this analysis, it was possible to identify three latent variables that describe the productivity of the sample: one factor that captures the inflation of all the observed variables, one factor that measures individual productivity and one factor that measures the joint productivity of faculty members. The findings suggest that there is a need of novel approaches to policies for measurement and support of faculty productivity. These policies should be oriented not only to increase the productivity rates but also to decrease the probability of inflation.

Okafor (2011) carried out a study in the University of Nigeria, Nsukka. This study intended to find out the extent of research output of academics in six Nigerian universities

and to know where the academics published more. To determine the research output of the respondents, the academics were asked to state the number of their publications during the last three years by types of publications. In order to know the result of the research activity, six categories of research publications were identified, which included dissertation, scientific monographs, and articles in journals with a referee system, other articles and proceedings from conferences, and reports. The sampling technique used for the study was stratified random sampling. The analysis of the data with ANOVA showed that there was no significant difference between mean productivity of academics from those different universities. Even though the academics find difficult to publish in international journals due to a low article acceptance rate, there is not a significant difference in the research output of academics in the universities used for this study in southern Nigeria, but there was a statistical difference in the research output between the universities when local journal publications were considered.

Heras (2005) examined the results of one of the most sensitive issue in higher education policies in Mexico: the awards programs for professors and researchers. The aim of this study was to identify the educational, economic and political context in which awards programs started in Mexico. Further, a detailed analysis was carried out of the PROMEP and the SNI to identify how these programs motivate professors' research productivity. The results indicated that the programs PROMEP and SNI have contributed and provided economic incentive for professors. The results also showed that these programs will contribute eventually to the research in Mexico due to their attractive economic incentives. On the other hand, PROMEP tries to benefit a large group of

scientists paying them scholarships; whereas, SNI covers just a reduced number of researchers in Mexico.

### **1.2.3 Factors affecting productivity**

The following section reviews previous studies that address the factors affecting productivity.

Research productivity over the life cycle is one of the aspects of individual productivity that has received more attention. Gary Becker (1962) and Schultz (1963) are the pioneers in exploring how the life cycle may condition research productivity. Subsequently, a number of researchers have tried to test life cycle effects in different contexts.

Bernier et al. (1975) found that publications and citations have peaked for those in the 40-44 age group. The study also correlates measurements of quality, including number of citation, number of PhD's graduates, funds and peer evaluation of research quality with the publication volume. Overall, they found that quantity and quality are highly positively related. On his behalf, Cole (1979) found that age has a relationship with quality and quantity of productivity. He suggests that there are small increases in productivity through the thirties. Levin and Stephan (1991) developed a model of productivity that considers that engagement in research is not only because of financial rewards, but also for personal satisfaction. They also found that publications increase at the age of 45. Tuner and Mairesse (2003) analyzed the impact of research productivity with age, gender and education. They found a relation between the age of professors and the number of publications. Researchers' productivity increases before fifty and then it declines after

fifty-one. Finally, their results suggested that graduates from *Grandes Ecoles* publish more and women publish on average almost .9 papers less than men per year.

A slightly different perspective on understanding productivity is presented by Allison and Stewart (1974), who found that highly productive researchers maintain or increase their productivity because they receive recognition and resources, while those researchers who do not, become less productive and have to leave their careers as researchers. This inequality increases with age.

Another aspect is sex differences, a topic that has also captured the attention of researchers. Several studies have found that female scientists publish at lower rates than male scientists. Long (1992) found that sex differences in the number of publications and citations are larger during the first decade of the career and later they are reversed. The findings showed that males publish between 26% and 91% more than women. Xie and Shauman (1998) found that sex differences in research productivity have declined over the years. The female to male ratio increased from about 60% in the late 1960's to 75% to 80% in the late 1980's and early 1990's.

Finally, education is another aspect which has been taken into account in previous studies. For example, Bunchmueller et al. (1999) developed a productivity model where publications depend on the graduate schools (Master and Doctoral degrees), the type of initial job after graduating, some personal characteristics and unobserved factors. The findings suggests that graduates of the top ten programs who had some experience as research assistants were more productive.

The following table of Gonzalez (2005) presents a summary of the factors affecting productivity that have been studied through the years and the key findings.

<b>Factors</b>	<b>Author</b>	<b>Key Findings</b>
<i>Age</i>	Bernier et al. (1975)	Life cycle with a peak in the 40-44 group
	Cole (1979)	Life cycle with a peak before 50
	Levin and Stephan (1991)	Life cycle with a peak at 45
	Turner and Mairesse (2003)	Life cycle with a peak at 50
	Allison and Stewart (1974)	Inequality between productive and unproductive researchers increases with age.
<i>Gender</i>	Long (1992)	Males publish between 26 and 91% more than women
	Xie and Shauman (1998)	Female to male ratio from 60 to 80%
	Tuner and Mairesse (2003)	Women publish .9 fewer paper per year.
<i>Education</i>	Buchmueller et al. (1999)	Graduates from top schools with research assistant experience and employed in research universities are more productive
	Turner and Mairesse (2003)	Graduates from Grande Ecoles are more productive.

**Table 1.** Literature review of the factors affecting productivity (Gonzalez, 2005)

In the table of Gonzalez (2005), there are many characteristics such as the purpose of the study and period of time, which varies among the studies. Some findings presented in the table could be weak and inconclusive. However, this section tries to report some results from the previous studies. It also shows new directions and how past success influences future performance in productivity.

In a nutshell, there are several studies in the table (Bernier et al, 1975; Cole, 1979; Levin and Stephan, 1991; Turner and Mairesse, 2003; Allison and Stewart, 1974; Long, 1992; Xie and Shauman, 1998 and Buchmueller et al., 1999) that have been conducted

to examine the relationship between productivity and factors which affect it. Some earlier studies primarily focused on analyzing productivity with variables such as age, gender and education. More recent studies incorporate psychological and other latent variables. However, it has been shown that the productivity, in general, per person may also depend on other various factors such as funds, equipment, teaching loads, policies, working conditions and context, to presence of children and marital status among others (Dundar and Lewis, 1998; Kyvik, 1993; Ramesh and Singh, 1998, Sandoval Denigri, 2011; Mairesse & Pezzoni, 2013). Below the studies about some other different factors that have an impact on productivity are presented.

In 1926, Lotka reported that 60 percent of faculty in any given field have produced just one publication in their field. The results of several later studies have, however, shown that productivity differences in scientific publishing are less than indicated by Lotka. Nevertheless, there exists a highly skewed pattern of productivity in scientific publishing (Kyvik, 1991). Average scientific productivity rates show large variation across variables such age, gender, academic ranking and discipline.

Some studies have shown that the productivity of publications at individual levels tends to increase within the academic ranking. (Bordons et al., 2003 and Kyvik, 1991). Kyvik (1991) examined four factors that may explain the differences between academic ranking: 1) there are differences in abilities for doing research between positions groups. 2) The higher the rank, the more time used for research. 3) The higher the rank, the easier it is to obtain funding and assistance for research and 4) full professors have closer ties to the informal communication network in science than the other groups. Kyvik argues that all the factors are likely to contribute to the observed productivity differences.

In other studies, it is commonly demonstrated that good scientific environments stimulate productivity and several studies have shown that the productivity is influenced by the environment. The environmental factors can influence whether a person has possibilities to turn into a productive scientist or whether a research group will flourish or not. According to Smeby and Try (2005), the contextual factors have the greatest impact on the indicator that is considered to be the most essential when assessing research performance: published scientific articles, climate, age as well as proportion of faculty members with PhD's have a significant impact on research output.

Sogi, Perales, Anderson and Bravo (2002) identified personal, institutional and contextual factors involved in the scientific papers production process by Medical school researchers. The subjects were interviewed about various aspects of the scientific production process. The results were that during the period 1990 through 2001 from 994 faculty members, 149 (15%) published scientific papers in journals. The qualitative analysis highlighted the consensus that scientific studies results should be published, but requirement of minimal material and social conditions was not always satisfied by the university. Their conclusions were that the production of scientific papers varies among Medical School researchers, and there are various limiting factors such as gender, age, academic level, institution, research skills, and productivity among others. The university should consider process peculiarities and correct interferences by releasing specific norms.

Sandoval and Denegri (2011) carried out a study to describe the factors associated with scientific productivity. The factors were classified into personal (gender, marital status, the presence of children, and age) and institutional (research orientation,

academic collaboration, the size of affiliation department, academic rank and tenure, institutional prestige, and the presence of resources). This study suggested that the factor more associated with research productivity is the attendance to foreign conferences. Then, some other factors which had a low impact on research productivity is to review colleagues' articles (peer review), to be member of international research societies and have collaborators.

Salazar and Almonte (2006) carried out a study in Philippines higher education institutions (HEIs). The purpose of the study was to find out what affects the research productivity. Forty faculty members from fourteen universities and colleges in the country responded to a survey questionnaire. The authors found that the faculty members perceive some factors that would, in their perception, improve and enhance research productivity. The results were: time, strong belief in research endeavor, faculty involvement, positive group climate, working conditions and organizational communication, decentralized research policy, research funding, and clear institutional policy for research benefits and incentives.

Other studies have shown large gender differences in scientific productivity where female researchers are less productive than men (Dag W Aksnes et al., 2011; Kyvik and Teigen, 1996). Aksnes et al. (2011) found that for almost all age groups and domains men were more prolific than women and female tended to publish generally between 20- 40 percent fewer publications than their male colleagues. Long (1992) found that sex differences in the number of publications and citations are larger during the first decade of the career. Some studies have found that female scientists publish at lower rates than male scientists. Policies also implied the full dedication of female faculty members since

productivity is valued by these mandates. One study done by Levin and Stephan (1991) considered that scientists were engaged in research not only because of the future financial rewards, but also for personal satisfaction.

Sulo, Kosgei, Tuitoek and Chelangat (2012) carried out a study in Moi University, Kenia. The aim of this study was to investigate the factors affecting the research output in this university. Specifically, the study aimed at determining the relationship between accessibility to research funds, the amount of time allocated for research, the qualifications of the researchers and the research environment, with the research output by the staff. The participants were 242 of the academic staff of Moi University. Random sampling was used to select respondents. The data collected was analyzed using descriptive and inferential statistics.

The study findings indicated that male and female respondents respectively reported that gender had no effect on their ability to conduct research; an average of 36.8% of the respondents disagreed that research funds from Moi University were easily accessible; respondents strongly agreed that time is a factor that affects research activities in the University. They further agreed they often lacked time to carry out research activities, and consequently their productivity. 51.8% of the respondents also agreed that if the institution sets aside time for research work for staff members, there would be more research activities going on. In general, the respondents agreed time was a factor to be considered when conducting research. The results, therefore, indicated that better qualifications, improvement in research environment, increased funding, and more time availed to staff for research will likely increase research output.

A large-scale study by Aksnes et al. (2011) showed that male professors are by far the most productive ones in a university. On average, the male professors published 9.5 publications during a four year period. The associate professors reported 4.5 publications while PhD students had the lowest productivity (2.9 publications). A similar pattern was found for female researchers. The average productivity of publications is lower for women in all categories. This study also found that for both men and women the associate professors obtain the lowest citation rates and the postdocs the highest. Despite the high productivity of associate professors, they did not rank at the top in terms of citation rates. It is interesting that professors with highest academic rank have more recognition and reputation in the scientific community.

Escalante and Ibarra (2002) explored the situations of some female researchers in the University of Morelos, Mexico. The main aim was to analyze the effect of their work as professors on the other roles in their life. The participants were four female professors who were interviewed about their professional development, family-work relation, professional concepts, aspirations and family and personal projects. The results were that some of them do not have enough salary and they have to deal with their work and household. Besides, the professors seemed to be modern women who have created strategies for living with all their university tasks and their families.

In many studies the relationship between productivity and age has been addressed. Although the results of previous studies have not always been entirely consistent, it seems to be quite firmly established that there is a curvilinear relationship between age and productivity (Issaksson and Linberg, 2012). Some studies have demonstrated that the average production of publication increases with the age and

reaches a peak at some point during the career and then declines (Barjak, 2006; Cole, 1979; González-Brambilia and Veloso, 2007; and Kyvik, 1990).

A recent large-scale study confirms these previous results and this pattern have been found across many fields and nations (Dag W. Aksnes, Kristoffer Rorstad, Fredrik Piro, & Gunnar Sivertsen, 2011). The results of this macro-study can be considered to have a high degree of reliability and shows that the productivity measured in terms of annual number of publications is increasing according to age, reaching a peak late in the career, and declining thereafter. The highest productivity number is found for the 50–54 and 55–59 age groups. This study shows that the age productivity differences are very large. In 1953, Lehman found in a study that young people tended to be made more important discoveries rather than the old people. He concluded that the majority of scientists are the most creative when they are in their late thirties or early forties. Cole (1979) argued that Lehman's study showed flaws. Nevertheless, some later studies have supported Lehman's findings (Stephan and Levin, 1993).

Veloso, Ashish, Krackhardt, Lowe, and Morgan (2005) carried out a study whose aim was to contribute to an understanding of the dynamics of academic scientific productivity. First, they analyzed how personal and institutional characteristics condition the productivity of individual researchers. Then they focused on how the social capital that researchers build through their collaborations relates to their scientific productivity. The results showed that aging is not a critical driver of productivity for scientists. This implies that an expected increase in the average age of researchers does not necessarily imply any significant degradation in a science system. Finally, the work showed that

recent policies that universities and government agencies have launched to more closely link scientific research with industrial innovation are affecting scientific productivity.

In a study of Spanish academics in three scientific areas, Costas, van Leeuwen and Bordons (2010) found that citation rates declined steadily by age and that people under 40 have the highest citation per publications. Cole (1979) reported that the overall citation rate was highest for people between the ages of 40 and 44. Similarly a study of Mexican scientists revealed a corresponding pattern, but with a delayed peak reached when the researches were 56 years old (Gonzalez-Brambilia and Veloso, 2007).

Gringas et al. (2008) reported a very different relationship in an analysis of Canadian researchers. He found a U shape curve where citation rates declined for people from 28 to 50 and then increased until about 70. Some other studies have not found any evidence of age specificity in scientific impact. Overall, there are large variations.

The universities make an effort to enhance the research productivity and the previous studies show that there are many factors which may affect research activity. Some studies about research in higher institutions have focused the attention on factors such as: policies, age, and gender, etc. providing a picture about research but without studying how these factors interact among themselves. Besides, the literature review demonstrates that professors are expected to teach, be involved in service or administrative functions and conduct research (Blackburn & Lawrence, 1995; Boyer, 1990; Gappa, Austin, & Trice, 2007; Jacobs & Winslow, 2004; Schuster & Finkelstein, 2006), what makes difficult to increase their productivity. Therefore, these difficulties have raised an interest to study some personal factors which can have an influence on the production of faculty members.



## **CHAPTER 2**

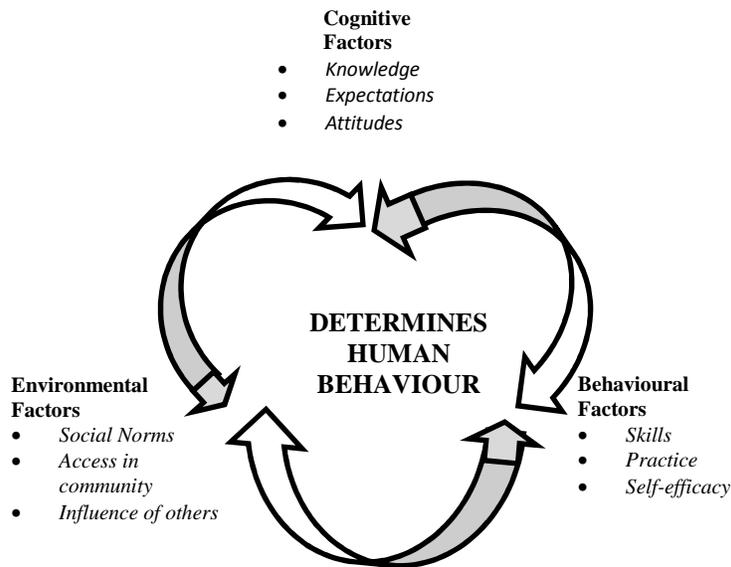
### **THEORETICAL FRAMEWORK**

This study is framed within the Social Cognitive Theory of Albert Bandura. In the following section it is presented the theory of Bandura which is the theory that provides the foundation for this thesis in order to interpret and understand the results.

#### **2.1 Social Cognitive Theory of Albert Bandura**

Albert Bandura was the major motivator behind the Social Cognitive Theory (SCT). This theory is also well-known as the social learning theory. This theory provides a framework for understanding, predicting and changing human behavior and the major premise is that people can learn by observing others (from each other); via observation, imitation, and modeling. However, it is important to consider some factors which influence people to behave in certain ways. The Social cognitive theory suggests that a combination of cognitive, behavioral and environmental factors influences behavior (Bandura 1977, 1986). Bandura's theory emphasizes the role of observational learning, social experience, and reciprocal determinism in the development of personality. The social cognitive theory is a theory of human behavior. For that reason, Bandura takes into account some factors that have a great influence on people's behavior.

Bandura was interested in how certain factors influence the development and changes of behaviors, and he designed a conceptual model in which the interaction process for humans' behaviors changes is clearly observed.



**Figure 2.** Model of factors that influence behaviour adapted from Bandura's theory.

In the model, there is an interplay among the three factors, and they are constantly influencing each other. The social cognitive theory explains how people acquire and maintain certain behavioral patterns and they depend on the factors because behavior is modified by all of them. This is called reciprocal determinism.

### **2.1.1 Reciprocal determinism**

The Social cognitive theory addresses the psychosocial functioning in terms of triadic reciprocal causation, known as reciprocal determinism (Bandura; 1986). In this dynamic process, behaviors, cognitive and environmental factors all operate as interacting determinants that influence each other bi-directionally. These factors are

affected among themselves and in turn they affect people's behavior. The perspective focuses on how people learn within their social context; the external but also the internal events.

### **2.1.2 Environmental factors**

Environment provides a framework for understanding behavior (Parraga, 1990). Glanz (2002) defines environment as the factors physically external to the person which provides opportunities and social support. Environmental factors are an identifiable element in the physical, cultural, demographic, economic, political, regulatory, or technological environment that affects the survival operations and growth of an organization (Business Dictionary, 2013). The environment is not a monolithic entity. The environmental influences can be social and physical which can affect a person's behavior, everything external to the self. The social side includes a person's friends, colleagues and family or external items such as social, political, cultural and personal. On the other hand, the physical environment is the size of a room and the ambient temperature. Any type of environment provides models for behavior.

The Social cognitive theory distinguishes three types of environmental structures (Bandura, 1997). They are the imposed environment, selected environment and constructed environment. They represent gradations of changeability requiring the exercise of increasing levels of personal agency. The imposed environment is thrust upon people whether they like it or not. They have little control over it but they have leeway in how they construct and react on it. The selected environment is constituted by choice of associates, activities and milieus. The environments that are created do not exist as a

potentiality waiting to be selected and activated. The construction of environment affects the nature of reciprocal interplay between personal, behavioural and environmental factors. In the bidirectional view of evolutionary processes, environmental pressures fostered changes in biological structures and upright posture conducive to the development and use of tools. These endowments enabled an organism to manipulate, alter, and construct new environmental conditions. Environmental innovations of increasing complexity, in turn, created new selection pressures for the evolution of cognitive capacities and specialized biological systems for functional consciousness, thought, language, and symbolic communication.

Banduras' social cognitive theory (1990) focuses on environmental factors which play an important role in the development of human behaviour. Behavioural changes occur within a network of social influences. It means that the changes in behavior depend on the environment and social factors that can aid, retard or undermine efforts. Catania (1990) believes that social influences generally have a great impact and may also have considerable influence on beliefs. Settings modify personal capabilities and social relations and affect how people generate goals and actions. In other words, environmental settings affect personal behaviors. They function as a guide movement towards behavioral change. In a nutshell, an individual's environment affects the development of personal characteristics as well as the person's behavior, and an individual's behavior may change their environment as well as the way the individual thinks or feels. However, people also require strong self-belief to accomplish goals and develop certain skills; and consequently change their behavior.

### **2.1.3 Self-efficacy**

Modeling is a highly effective method for developing skills; however, people's success requires not only skills but also strong self-belief in one's capabilities to control events to accomplish goals (Bandura, 1988). Self-efficacy is the belief in one's capabilities to organize and execute actions required to manage prospective situations. In other words, self-efficacy is the person's beliefs in his or her own ability to succeed in a particular situation. Bandura (1994) described these beliefs as determinants of how people think, behave, and feel. An individual's self-efficacy plays a major role in how goals, tasks, and challenges are approached. There are four major sources of self-efficacy.

1. **Mastery Experiences:** Mastery experiences are the most effective way of developing strong self-efficacy. To perform a successful task reinforces the sense of self-efficacy. But, performing a failed task can undermine the self-efficacy.

2. **Social Modeling:** Another important source of self-efficacy is to witness other people conclude tasks successfully. Bandura (1977) claims that seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities master comparable activities to succeed.

3. **Social Persuasion:** People could be persuaded to believe they have skills and capabilities to succeed. Saying to someone something positive or getting verbal encouragement leads the person to achieve the goal and overcome self-doubts

4. **Psychological Responses:** Our own responses and emotional reactions (Moods, emotional states, physical reactions, and stress levels) to situations also play an important role in self-efficacy. They can impact how a person feels about their personal abilities in

a particular situation. Learning how to minimize stress and enhance mood when facing difficult or challenging tasks, people can improve their sense of self-efficacy.

Besides, there exist self-efficacy in changing structure of family systems which play an important part. The parent's roles are difficult because parents need to deal with changing challenges as the children are growing older and the parents need to deal with social systems including educational, recreational, medical and caregiving facilities. The family has been undergoing major structural changes. The number of single-parent families is on the rise. More and more women are joining the work force either by economic necessity or personal preference. Women are educating themselves more intensively and seeking fulfillment in career pursuits as well as family life. The society changes look for a balance in the home and equality of occupation opportunities in the workplace.

Nowadays, women manage the family demands as well as the demands of their occupational roles. There is a variation among working women in the types of role demands they face, in the degree to which work and family demands conflict, in the level of responsibility for the care of children and household, in the availability of adequate child care and the type of stressors, satisfactions and feelings of accomplishment women experience at home and at work. It is not surprising to find that this wide diversity of different adaptational conditions have effects of multiple role demands which are ambiguous and inconsistent. Even when there are similar conditions, the effects differ across individuals.

Ozer (1992) presents evidence that perceived self-efficacy to manage the different aspects of multiple role demands is an influential factor in how women's lives are affected. According to Ozer family income, heaviness of occupational workload or division of child care responsibility have direct effect on women's well-being. These factors operate through their effects on perceived self-efficacy. Ozer's research shows that a sense of efficacy in managing dual roles contributes to positive well-being rather than merely protecting against distress. Regardless of family structure, parents who have a high sense of efficacy are active in promoting their children's competencies.

Social structural theories and psychological theories are often regarded as rival conceptions of human behavior or as representing different levels of causation. In the social cognitive theory, the triadic reciprocal causation, social structural and personal determinants are integrated as cofactors within a unified casual structure. For example, if individuals cannot provide adequately for their livelihood because they lost their job, their lack of money is a particular type of determinant that affects their behavior and well-being.

The self-efficacy also impacts multiple roles on women's work behavior. Women work at the home and they are responsible for the household and children care. The impact of multiple roles on women's work behaviour and career development has received increasing attention (Hackett et. al., 1991). Women often adopt strategies to choose traditional female occupations that are perceived to be easier to combine home and family rather than translate their interests and abilities into career pursuits (Fitzgerald and Weitzman, 1992). College women consistently report stronger efficacy for managing multiple roles in conjunction with traditional versus non-traditional careers. They also report feeling more efficacious than men in balancing work and home demands. Overall,

college aged women report high levels of confidence in their abilities to manage multiple roles (Lefcourt and Harmon, 1993).

The choices people make during formative periods shape the course of their lives. In general terms, choices determine the lifestyle people follow. Among the choices that affect life paths, those that center on occupational choice and development are of special importance. According to the rational model of human decision making, individuals supposedly explore a wide range of options and calculate the advantages and disadvantages. Beliefs of personal efficacy play a key role in occupational development and pursuits. The higher people's perceived efficacy to fulfill educational requirements and occupational roles, the wider the career options they seriously consider pursuing and the greater the interest they have in them (Betz and Hackett, 1981; Lent, Brown and Hackett, Matsui, Ikeda and Ohnishi, 1989).

Recent studies have shown that overestimation of personal controllability is present among adults. Heckhausen (1990) has shown that younger, middle-aged and older people consider attributes as being more controllable than undesired ones, and older people believe that undesired attributes occur later in life and are more controllable than do younger and middle-aged people. Therefore, people who are affected by important changes hold higher control beliefs over these changes than do persons who are not yet directly concerned with those aspects of life.

Having old age clearly involves gradual decrements in capacities even if the control beliefs of aging persons are generally higher than expected by younger people. The majority of aging people are not pessimistic that their fears become self-fulfilling

prophecies (Bandura, 1981). If people are asked to compare themselves, they will ascribe control to themselves. It means that their potential influence. The optimism is warranted. Middle aged and old-aged people perceived themselves as appearing and as feeling younger than older people of their age. In a study of self-ascribed control, a large sample of adolescents perceived themselves as having more control than their peers. The few subjects feeling less control than their peers generally held very low control beliefs (Flammer, Grob and Lûthi, 1987).

Studies about control illusions (Langer, 1975; Miller and Ross, 1975) are also relevant to the issue of overestimation of personal control. Taylor and Brown (1988) have summarised evidence of systematic illusion phenomena with regard to self-image in which people think of themselves more positively than most other people and to the judgement of the future in which people believe that things will improve for them in the future, more than the others. Taylor and Brown (1988) stress that illusions are positive for mental health, happiness, ability to care for others and capacity for creative and productive work; without mentioning possible developmental benefits for positive developmental changes.

Even if across average age groups general control beliefs do not reflect real control of and changes in control, such measurements may still reflect veridical and reliable individual differences both in control beliefs and in actual control. To maintain a high sense of control, it is necessary to study the conditions under which individuals develop more or less stable beliefs in high or low control.

People cannot influence their own motivation and actions very well if they do not pay adequate attention to their own performance, the conditions under which they occur

and the immediate and distal effects they produce. Therefore, success in self-regulation partly depends on the fidelity, consistency and temporal proximity of self-monitoring.

#### **2.1.4 Self-regulation**

In social cognitive theory human behavior is motivated and regulated by the ongoing exercise of self-regulation. Self-regulation also encompasses the self-efficacy mechanism. This mechanism operates through a set of three psychological functions that must be developed and mobilized for self-directed change (Bandura, 1986): self-monitoring one's behavior, judgments and affective self-reaction. They are described briefly:

Self-monitoring: people cannot influence their motivation and actions very well if they do not pay attention to their own performance, the condition where they occur and the effects they produce. Therefore, success in self-regulation partly depends on self-monitoring.

Judgments: judging the actions play a major role because the favorably or negatively performance will depend upon the personal standards against which it is evaluated.

Self-reaction: self-reactions provide the mechanism by which standards regulate courses of action. This is achieved by creating incentives for one's own actions and anticipate affective reactions to one's own behavior depending on how it is measured up to an internal standard. People tend to pursue courses of action that produce positive self-reactions. To sum up, if you did well in comparison with your standard, you give yourself rewarding self-responses. If you did poorly, you give yourself punishing self-responses.

All these concepts are important to human personality development. Behaviors, cognitive-personal and environmental factors together with perceptions, thoughts and feelings shape our personalities.

Reciprocal determinism has been shown to be present in various cases, countries and applied in different topics. In some cases, studies are focused on how environmental factors affect certain situations or activities. However, reciprocal determinism does not appear to work in the same in all situations; it crosses cultural boundaries and can be applied across a variety of fields.

## **CHAPTER 3**

### **RESEARCH METHOD**

#### **3.1 Methodological Approach**

A qualitative approach was used in this investigation. Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The objective is to observe the phenomenon without upsetting, changing, modifying or applying new variables (Corbetta, 2003 in Hernandez, Fernandez and Baptista, 2006, p. 9). The process of qualitative researches involve emerging questions and procedures, data collected in the participant's settings, data analysis building from participants to general themes and the researcher making interpretations of the data. Research focuses on individual meaning and the importance of rendering the complexity of a situation (Creswell, 2007). Qualitative investigations are carried out through a detailed, in-depth data collection involving multiple sources of information, and report a case description (Creswell, 2007). "Qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning of individuals or groups ascribe to a social or human problem" (Creswell, 2007, p. 37).

In a nutshell, qualitative research studies the phenomenon in its natural setting and within its particular context and the objective is to understand and to interpret. The qualitative investigator is allowed to have an internal perspective, but remains analytic and an observer of the problem from an external perspective (Hernandez, Fernandez and Baptista, 2006). Qualitative studies are framed within a set of philosophical assumptions:

the ontological (nature of the investigation), epistemological (the relationship between the researcher and their object of study), axiological (the role of values), rhetorical (narrative structure of the study) and methodological (process of the study) assumptions (Creswell, 2007). These assumptions exist in relation to the nature of the study and suggest to take a philosophical stance on each of these assumptions (Creswell, 2007) when carrying out a qualitative investigation. In the following lines I gave a description about the nature of the present study and its general characteristics.

### **3.1.1 Case Study Design**

As it was mentioned, this investigation was undertaken with a qualitative approach. Into qualitative studies there exist different designs (ethnography, case study, grounded theory, action research, etc.). The chosen design for this investigation is a case study. Case studies are meant to explore new processes or behaviors that are little understood (Hartley, 1994). Researchers have argued that certain kind of information can be difficult or even difficult to tackle by means of other than qualitative approaches as the case study (Sykes, 1990). An important advantage of case studies is that researchers have the opportunity for a holistic view of the process (Gummesson, 1988). Creswell (2007) states:

A case study is a good design when the inquirer has clearly identifiable cases with boundaries and seeks to provide an in-depth understanding of the cases or a comparison or several cases (p.74).

A case study research consists of studying a specific, bounded system or systems with unique qualities, context, situation or characteristics. Yin (1993) states a case study

is an empirical inquiry that investigates a contemporary phenomenon with its real context. A case study addresses a situation in which boundaries between phenomenon and context are not clearly evident. According to Stakes' classification (1999), case studies could be intrinsic (the interest is on the case itself), instrumental (the case is used to study some related event) or collective or multiple (studies different cases surrounding the case).

This study, based on Stakes' classification, is multiple since the focus is on examining how productivity is affected for some factors. The principal difference between case studies and other research studies is that the focus of attention is on the case not the whole population of cases (Stake, 1999). The methodology for this case study is based on Creswell's (2007) interpretative format for qualitative studies. A single case is selected precisely because the researcher wishes to understand the particular in depth, not to find out what is generally true of the many (Merriam, 1998).

### **3.1.2 Context**

The investigation was conducted at the University of Quintana Roo, campus Chetumal. Some of the policies at this public university are: the optional participation of researcher professors' in the National System of Researchers (SNI), the Faculty Development Program (PROMEP) and the Incentives Program for Teachers (Carrera Docente). This information is very important because it is considered as a priority to strengthen the spreading of research productivity inside or outside this university.

The university recognizes as part of its essential functions the generation of new knowledge. This would be accomplished throughout scientific research as well as innovation processes. For the University of Quintana Roo, it is a priority to strengthen

academic skills by consolidating research groups (CA: *cuervos académicos*) through high quality research, both at individual and collective levels as well as national and international milieus. At the macro level, governments provide funding for research. To have access to this funding researchers submit research proposals to a funding entity, which uses external referees and peer review committees to decide which are promising proposals that ought to be supported(Gonzalez Brambila, 2005).

The UQroo has three campi and in Chetumal campus, there is the English language BA program and Language Center where foreign languages are taught to all the university community. In Chetumal and Cozumel campi, there are 28 foreign languages full time professors. Eight have doctoral studies, four are studying it, two are candidates and fourteen have a master's degree. Two are members of the SNI level 1 and two more are candidates. 26 professors have the profile PROMEP (Reyes, in press).

Furthermore, professors must devote at least eight hours to research activity if they are associate, and sixteen hours if they are full professors. Teaching must be between eight to sixteen hours (Reyes, in press).

To become a full professor, the candidates must fulfill a series of requirements. There are six categories: associates (a, b and c) and full professors (a, b and c). When accepted, the professor receives a full time position; in the seventh year or even at fourth year, they can have a sabbatical year and apply for a PROMEP scholarship (Reyes, in press). However, the positions are not permanent positions because professors can be dismissed if they do not accomplish their academic tasks and commitments with the institution.

Professors are constantly evaluated (once a year). This evaluation includes different requirements that both associates and full professors should comply in the Annual Academic Plan where professors include their commitments regarding research, teaching, and administrative appointments among other academic functions they must accomplish.

On the other hand, it is important to mention that faculty members need to be part of research groups. Professors are involved in consolidated academic research groups or non-consolidating academic research groups. At the UQroo there exist two non-consolidated (in consolidation) groups.

According to Reyes (in press), there is an institutional document which states the number of hours for each one of the functions: teaching, research, administrative appointments and tutorship. It is compulsory to dedicate at least eight hours to research if the professor is associated , and sixteen if he is full professor.

### **3.1.3 Subjects of the Study**

The participants were purposefully selected because of their research activity in their respective field at the University of Quintana Roo. Professors working in the Language and Education Department at University of Quintana Roo are not only required to teach but also to do research.

### **3.1.4 Sample**

Convenience sampling was used to select the subjects for this study. This type of sampling attempts to select people who enrich the work with their information related to

the phenomenon, and it is frequently used in qualitative research (Miles & Huberman, 1994). Convenience sampling does not allow to make generalizations about the total population because it is not representative enough (Patton, 2002). Regarding the present study, convenience sampling was used for the recruitment of participants. Participants' selection criteria was according to the needs of the study, trying to have a balance between women and men with different academic rank, education, number of children and marital status. These professors shared their experiences and how they relate to the phenomena being investigated. As this sampling occurred conventionally, the information provided by the professors varied in the results and we had an opportunity to observe different patterns because they contributed with different information.

### **3.1.5 Data Collection Procedures**

The choice of data collection procedures should be guided by the research question and the choice of design. The case study approach typically combines data collection methods such as archives, interviews, questionnaires, and observations (Yin 1989). However, the choice of data collection methods is also subject to time constraints, financial resources, and access. Duff (2008) points out that there should be a specific objective behind every chosen instrument and it has to be according to the objective of the study. In qualitative studies, there is a variety of instruments for data collection and in case studies, qualitative and quantitative data collection instruments can be used.

Creswell (2007) describes the different procedures and instruments for data collection in a case study:

Access and rapport: Gaining the confidence of the participants, becoming familiar with them.

Sampling: Find a bounded, special case.

Type of information/sources of information: Documents, records, interviews, direct/participant observations, physical artifacts, tests, elicited responses, stimulated recall, verbal reports and questionnaires.

Recording information: Field notes, interview and observational protocols.

Storing data: Field notes, transcriptions, computer files.

Document analysis: Relevant paperwork and artifacts (textbooks, articles, students' writings or assignments, course outlines, research journals).

In this qualitative research, the instruments used were interviews and document analyses (CV or résumés). Interviews are basic elements, highly attractive alternatives and the most widely employed methods to collect qualitative data. That is the reason why interviews were chosen as the main instruments in this study. Document analyses helped to compare the information which resulted from interviews. Both instruments made the investigation richer in possibilities for gathering information. This triangulated methodology provided stronger substantiation of constructs in the thesis.

### **3.1.6 Instruments**

According to Creswell (2007), the collection procedure in qualitative research involves four basic types: observations, interviews, documents and audio-visual materials. Duff (2008) and Yin (2003) state that using multiple sources of data allows researchers to corroborate and augment evidence from other sources. Therefore, in this study the instruments were chosen according to the objectives, time and context. In

qualitative interviews, the researcher conducts face to face interviews, telephone interviews or focus groups. In this study, interviews face to face were chosen as the main instrument for gathering information. These interviews involved open-ended questions that were intended to elicit views and opinions from the participants. During the process, qualitative documents were collected as well. According to Creswell (2007), these may be documents (e.g. newspaper, official reports) or private documents (e.g. personal journals and diaries, letters, e-mails). In the following lines the instruments that were used in the research are described:

Instrument 1. Curriculum Vitae or Résumés (Documents analysis): The first instrument was the faculty members' curriculum vitae, also known as a résumé or CV. It is important to mention that in this study they are used as synonyms. A CV is a more comprehensive document that details all the past educations, experiences and competencies including public presentations, academic writing and professional development, all achievements. Even when a CV is used when applying for contracts, advance research or teaching positions and résumé is for work search, in this thesis CV and résumé are used interchangeably. I focused on research information from each CV which helped to analyze the productivity in articles, book, chapters of books and conference proceedings.

Instrument 2. Interviews: I developed questions for a semi-structured individual interview. Semi-structured interviews sometimes, called "moderately scheduled", were conducted with a fairly open framework which allowed for focused, conversational, two-way communication. The interview started with more general questions or topics, and then they became the basis for more specific questions. These questions were prepared

beforehand to provide the framework for the interview. The questions allowed new ideas to be brought up during the interview as a result of what the interviewee was saying. Kvale (1996) has suggested different kind of questions such as introducing questions, follow-up, probing questions, specifying questions, direct and indirect questions, structuring questions, silence and interpreting questions. The semi-structured interviews are useful to study specific situations and to make a diagnosis. In this work all these different types of questions were included since they provided access to the perceptions and professors' opinions about research. The questions were effective for gaining insight into problems that cause concern and are not immediately perceptible.

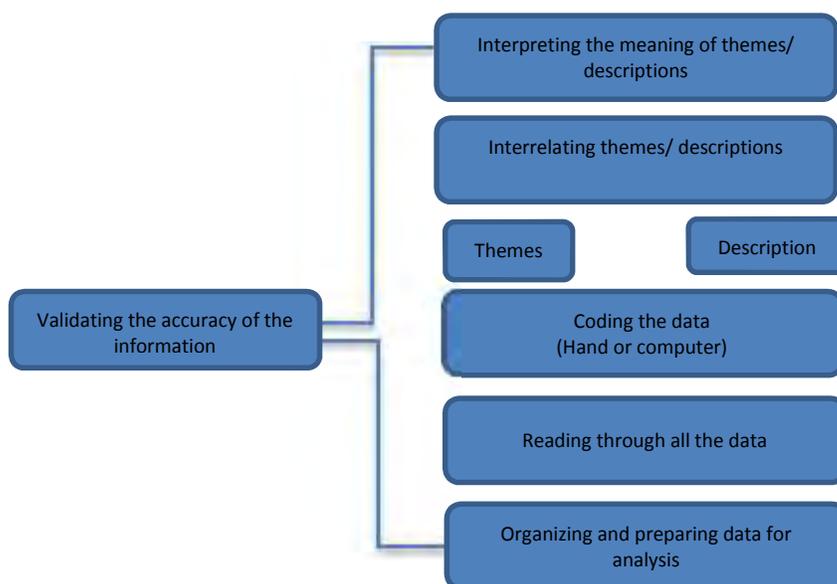
Qualitative studies are generally conducted at the research site and the researcher has personal contact with the participants. However, having the acceptance to participate in the investigation can be a delicate issue. Likewise, carrying out the study in an institution or workplace depends sometimes on the nature of the phenomenon being investigated and the people involved in the investigation, on the outcomes of the research, or a lot more possible factors. A great deal of the possibilities of having acceptance to participate in the study depends on the investigator and his or her approach to the participants and decision makers. To facilitate the investigator's duty when achieving the aim, Duff (2008) suggests the following: "Being familiar with the site and participants, being clear about the research objectives and procedures, not placing unreasonable demands on one's research participants, and offering some form of reciprocity..." (p. 126).

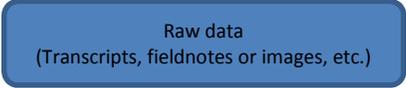
### **3.1.7 Data Analysis Procedure**

The process of data analysis involves making sense out of text and data. It involves preparing the data analysis, conducting different analyses, moving deeper and deeper

into understanding the data, representing the data and making interpretations of the larger meaning data.

Creswell (2008), Rossman and Rallis (1998) describe data analysis as an ongoing process involving continual reflection about data, asking analytic questions and writing memos throughout the study. It also involves collecting open-ended data, based on asking general questions and developing an analysis from the information supplied by the participants. For case studies, research involves a detailed description of the setting or individuals followed by analysis of the data for themes or issues (Stake, 1999). Despite these analytic differences depending on the type of strategy used, qualitative inquirers often use a general procedure and convey in the proposal the steps in data analysis. In the following model, a linear, hierarchical approach building from the bottom to the top is observed. The stages are interrelated and not always carried out in the order presented.





Raw data  
(Transcripts, fieldnotes or images, etc.)

**Figure 3.**Data analysis in qualitative research model.

In case studies, there are many types of data analysis such as holistic, embedded themes, within case and cross-case analyses (Creswell, 2007). Besides, we can find forms of data analyses such as categorical aggregation, direct interpretation, establishing of patterns and making a correspondence and making naturalistic generalizations.

There are also some computer programs created for data analysis in qualitative studies such as Atlas.ti, QSRNVivo, HyperRESEARCH and MAXqda. In this study Atlas.ti was used as the software to analyze data. With this tool, I explored the complex phenomena hidden in the textual and multimedia data compiled in the interviews. It is worth remembering that in qualitative studies there are no ordered specific steps to follow in order to achieve the expected results. In this way, the procedure required for this investigation consists of the following:

#### Phase 1 (Résumés)

First, I requested the professors' email addresses and I sent out a letter asking them kindly to participate in the study by sending me their updated résumés. They also signed a consent form. For this, I explained the key features of the project and emphasized professors that their participation would be completely voluntary and I assured them their responses would be treated in strictest confidence. With the compiled information from the résumés, I organized it in an Excel data base.

#### Phase 2 (Interviews)

To select the five professors and obtain consent from them to participate in the study, I established a procedure of how to approach the interviewees. First of all, I sent them an email or I called them first to ask and set an interview date. The interviews should be conducted in a quiet, suitable place for conducting. So, the place was the professors' offices. During the interviews, I audio-taped all questions and responses of the faculty members in the interviews. The interviews were individual and face to face. It was also important to have a protocol and be flexible, courteous and professional with professors. (Creswell, 2008). Soon after interviews were collected, I transcribed them, typed notes and sorted and arranged the data into different types depending on the sources of information. Then, I read through all data to obtain a general sense of the information and to reflect on its overall meaning. Then, I began to detail an analysis, organized the material into chunks of text before bringing meaning to the information (Rossman and Rallis, 1998). The program Atlas.ti 7 was used to aid the data analysis process. Once all relevant files had been integrated into Atlas.ti, the next stage of organizing data involved coding. I used this process to generate professor's comments analysis as well as categories or themes of analysis into codes. Finally, an interpretation of the data was made and the results of this analysis are reported later in the following chapter. . In this part, data analysis was carried out according to Creswell (2007). Three basic steps were used for data analysis:

- Reducing the data into meaningful segments and naming these segments.
- Combining the codes into broader categories or themes.
- Displaying and comparing in data graphs, tables and charts.

Thus, the information gathered in the field was interpreted and analyzed (Madison, 2005, Huberman and Myles, 1994, Wolcott, 1994). It was a process in which I reduced the

amount of information collected to make sense of them (LeCompte and Schensul,1999). As Patton (2002) suggested I organized the data, then I reduced through summarization and categorization and, finally, I found patterns and themes to link them. Therefore, findings were presented through the data analysis and interpretation of the data.

## CHAPTER 4

### DATA ANALYSIS AND INTERPRETATION OF THE DATA

Since this is a qualitative study, the analysis refers to interpret the gathered information and make sense of the interviews information and curriculum vitae documents. In this chapter, the first section provides the answers to the research questions, the results as well as the data analysis. Then, the second section presents the interpretation of the data based on Bandura's theoretical framework.

#### 4.1 Data Analysis and results

##### 4.1.1 Research question 1: What are the full-time professors' personal characteristics (sex, age, marital status, number of children, academic rank, education, participation in programs, administrative appointments and time of experience doing research) in the department of languages and education at University of Quintana Roo?

In relation to the first research question, a table with the full-time professors' personal characteristics is shown next.

Characteristics of the Professors				
Professors	Age	Sex	Marital status	Number of children
<i>Professor 1</i>	46 years	Female	Married	3
<i>Professor 2</i>	40 years	Male	Married	1
<i>Professor 3</i>	74 years	Female	Single	1 (adult)
<i>Professor 4</i>	40 years	Female	Married	0
<i>Professor 5</i>	36 years	Male	Married	1

**Table 2.** Characteristics of the professors

This table shows the personal characteristics of the five professors that were interviewed in this study. As we can observe, the majority of professors are middle aged and they are married with children. There are two males and three females.

Next, a second table is presented with the academic data of each professor.

Academic Data of the Professors

Professor	Education	Academic Rank		SNI		PROMEP		Carrera Docente		Administrative appointment		Research Experience	
			years		years		years		years		years		
1	Master	Associate Professor A	2	No	0	Yes	3	Yes	2	Yes	Academic Affairs Secretary (Secretaria técnica en docencia)	10 months	5
2	Master	Associate Professor A	3	No	0	Yes	3	Yes	1	Yes	Head of the Department of Language and Education (Jefe del Departamento de Lengua y educación)	7 months	3
3	Ph. D	Full Professor C	15	No	0	Yes	0	No	-	No	-	-	Not specified
4	Ph. D	Full Professor A	4	Yes	5	Yes	12	Yes	-	No	-	-	11
5	Ph. D	Associate Professor C	2	Yes	1	Yes	1	Yes	-	No	-	-	9

SNI: National System of Researchers (Sistema Nacional de Investigadores)  
PROMEP: Faculty Development Program (Programa para el Mejoramiento del Profesorado)  
Carrera Docente: Productivity Incentive Program

Table 3. Academic data of the Professors

In broad terms, regarding academic ranks, there are three associate professors and two full professors; two professors with a master's degree and three who have a

doctoral degree. Other aspects presented in the table are whether professors belong to programs that enhance research activity such as SNI, PROMEP and Carrera Docente<sup>2</sup> and the time expressed in years that they have been working in these programs. Two of the interviewees are members of the SNI; four professors have been awarded the profile PROMEP and they are also participating in Productivity Incentive Program. Furthermore, two professors hold administrative appointments. Finally, in the last column, the research experience was measured by years. Even though professors do not have the same time doing research, all of them have done research activity and that is one of main aspects in this analysis.

#### **4.1.2 Research question 2: What is the research productivity level of the professors?**

It is pertinent to mention again that productivity in this dissertation refers only to the tangible products such as articles, books, chapters of books and proceedings. Although manuals and handbooks are included in the following table, they are not considered as productivity in the present study.

In the following table the productivity of the five interviewed professors is broken down:

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<sup>2</sup> SNI: National System of Researchers (Sistema Nacional de Investigadores)  
PROMEP: Faculty Development Program (Programa para el Mejoramiento del Profesorado)  
Carrera Docente: Productivity Incentive Program

**Professors' Productivity**

<b>Parameters</b>	<b>Assigned Number</b>	<b>N times</b>	<b>Sum</b>
<b>Professor 1</b>			
Articles (2)	1 (national)		0
	2 (international)		
Books (1.5)	1 (national)		0
	2 (international)		
Chapters of books (1)	1 (national)		0
	2 (international)		
Proceedings (.5)	1 (national)		0
	2 (international)		
			<b>Total P=0</b>
<b>Professor 2</b>			
Articles (2)	1 (national)	2 national	4
	2 (international)		
Books (1.5)	1 (national)		
	2 (international)		
Chapters of books (1)	1 (national)		
	2 (international)		
Proceedings (.5)	1 (national)	3 national	1.5
	2 (international)		
			<b>Total P= 5.5</b>
<b>Professor 3</b>			
Articles (2)	1 (national)	2 national	4
	2 (international)		
Books (1.5)	1 (national)		0
	2 (international)	(8 handbooks & 2 grammar books)	
Chapters of books (1)	1 (national)	3 national	33
	2 (international)		
Proceedings (.5)	1 (national)	3 national	1.5
	2 (international)		
			<b>Total P= 8.5</b>
<b>Professor 4</b>			
Articles (2)	1 (national)	10 national	20
	2 (international)		
Books (1.5)	1 (national)	7 national	10.5
	2 (international)		
Chapters of books (1)	11 (national)	22 national	222
	2 (international)		
Proceedings (.5)	1 (national)	6 national	3
	2 (international)		
			<b>Total P=55.5</b>
<b>Professor 5</b>			
Articles (2)	1 (national)	5 national	10
	2 (international)	10 international	
Books (1.5)	1 (national)	1 national	1.5
	2 (international)	1 international	
Chapters of books (1)	1 (national)	3 national	3
	2 (international)	1 international	
Proceedings (.5)	1 (national)		2
	2 (international)		
			<b>Total P= 59.5</b>

**Table 4. Professors' Productivity**

As it is observed, there is an ample difference among the professors' productivity. The professors 4 and 5 show a high productivity; whereas professors 1, 2 and 3 have the lowest one. Interestingly, the professors who have a low productivity, have published more proceedings than articles, books or chapters of books. Professors who have a high productivity have published more articles compared with other types of productivity. Finally, it is observed that there are more national products than international ones.

**4.1.3 Research question 3: How age, sex, marital status and number of children affect productivity and what interactions can be found among them?**

Next there is a simplified table of the results of professors' productivity taken from the previous table above. Here, it is observed how the total sum of productivity differs from one to another.

**Professors' productivity**

Professor 1	0
Professor 2	5.5
Professor 3	8.5
Professor 4	55.5
Professor 5	59.5

**Table 5.** Simplified professors' productivity chart

In general terms, there is a wide productivity gap between the professor with the lowest productivity and the professor with the highest productivity (professor 1 had a 5.5 of productivity whereas professor 5 had 59.5).

In the following section, the analysis of how personal factors affect productivity is presented. The information was analyzed according to what was provided by the five professors. The personal factors are shown below in the following order: age, sex, marital status and number of children.

### **Age**

Four out of five interviewees mentioned that age itself is not explicitly affecting research. The four professors underlined that their early experiences as researchers were difficult at the beginning; however, they mentioned that they have gained experience through the years and this has helped them to improve in the research field. Therefore, they considered that the experience of doing research is the main factor which influences research activity, and therefore, productivity.

One participant highlighted that doing research has meant positive changes in her life because she has acquired research abilities and built confidence. Similarly, two professors added that through the years of experience, they have improved their abilities such as searching information on the web, writing skills and searching specific literature related to their research. The five professors agreed that the age per se is not perceived as a factor which impacts research, although it does affect research at the moment the professor starts doing the first works in research.

Although some of the interviewees started doing research at a young age and others at the middle age or older, this does not mean that older professors have more abilities or more experience than the younger ones. It is true that at the beginning there is a lack of confidence doing research but it is also true that over the years, professors feel more confident and competent.

Additionally, one professor who is above seventy years old stated that getting older could have negative effects on research activity by the fact of being more tired over the years. With respect to this she said:

**Professor 3:** I don't think age could affect research. It affects, I mean, it could be positive but also negative. It is positive because you acquire more experience and you make your research work more easily. On the other hand, it is negative because the elder you are, the more tired you feel. (Own translation)

This issue has been addressed in previous studies. Some concluded that there was a curvilinear relationship between age and research. In other words, research activity increases with age and reaches a peak at some point during the career and then declines (Diamond, 1986; Barjak, 2006; Cole, 1979; Gonzalez-Brambilia and Veloso, 2007; Kyvik, 1990). However, in this analysis the professors' comments revealed that gaining experience through the years changes the researcher's abilities. Aging is not a critical driver of productivity but it implies a notable increase since the professors have more experience through the years. If the production is low, multiple causes such as tiredness or other contextual factors should be considered. For example, the University of Quintana Roo does not give permanent positions which means that the professor's job is not guaranteed throughout all the working life. Instead, professors in the University of Quintana Roo are evaluated every year in order to conserve their jobs.

The difference with previous studies is that in other universities there exists a permanent position. So, professors in these types of universities work hard and make efforts in order to be promoted and get the permanent position. When they get it, it is

observed a decline in their productivity because they leave research behind. At the University of Quintana Roo, professors must do research for all the working life. Regarding this, Bandura argued that people's actions are highly influenced by factors among them the contextual ones. People self-regulate themselves and the self-regulation depends on the fidelity, consistency and the monitoring of themselves. In this case, professors know very well what motivates them to make efforts in research activity and they make these efforts to produce effects and achieve their objectives. They do not want to be dismissed therefore they work on research projects and fulfil all the requirements that the university asks.

### **Sex**

The five interviewees agreed that sex per se does not have effect productivity because they argue that males and females have the same abilities and intellectual capacities to conduct research. They claim rather than sex, what is probably affecting productivity is each one's personal circumstances. Therefore, each case must be examined on its own because research output may depend on other factors such as marital status, maternal duties or other family's responsibilities.

Three participants added that women, who are mothers, usually have other activities at home that they are not related to academic matters. Thus, female professors with children show some disadvantages regarding productivity because it is difficult for them to balance home chores, maternal responsibilities, and research. Because female researchers with children spend their personal time with their family rather than on research, so they seldom receive incentives that research activity provides. One female professor emphasized that there may be a negative impact on the

relationship between working mothers and research activity because it is difficult to combine academic matters with children care. Another professor claimed that working mothers in the field of research face challenges and this is the reason why many academic women decide not to become mothers or put off their careers until their children grow up. This participant said:

**Professor 5:** I think women face the challenge when they decide to become mothers and at the same time researchers. It isn't easy. I mean, research requires a lot of time of dedication for reading, writing, travelling to conferences and I believe that is the reason why many professors I know decide not to become mothers or put off their careers until their children grow up. (Own translation)

Previous studies (Aksnes et al., 2011; Kyvik, and Teigen, 1996) have shown large sex differences in scientific productivity in which higher productivity among males has been reported (Fox, 2005; Stack, 2004; Xie and Shauman, 2004; Prpic, 2002). In other words, there is ample evidence that has been provided about productivity differences between men and women over time. In these studies men have produced more research output than women (Cole and Zuckerman, 1984; Long, 1992; Xie and Shauman, 1998; Nakhaie 2002, Prpic, 2002; Penas and Willet, 2006; Symonds et al., 2006; Ledin et al., 2007; Abramo et al., 2009). Women have been considered in many cultures as the ones responsible for children and home; therefore, women produce less than men in research. Women need to work harder because they need to take care of the household and children, whereas men are mainly focused on their academic research. It is clear that there are some exceptions because there are men who are also responsible for the household and sometimes for their children, but most of the times, in the context of Mexico, women are responsible for the well-being of the household.

In this study we did not find a direct effect of the factor sex on productivity; however participants suggested that the effects are noticeable when other factors, such as such as marital status and number of children interact and interplay among them. They mentioned that there are also other variables that might be affecting research productivity. A parallel argument is arisen in Escalante and Ibarra (2002) in which women who are mothers and researchers at the same time need to create strategies to balance university tasks with family duties. The findings of the present study suggest that sex per se does not have an effect on productivity, but there are other factors associated with the role of being woman or man that may be affecting the research output.

### **Marital Status**

Four interviewees claimed that the fact of being married does not affect their research activities. They mentioned they have received support from their life partners, but they are the ones who decide not to work at home in order not to interfere with their family time. To summarize, professors do not find that being married or having a partner affects in anyway their research activities.

One professor claimed that she does not do academic work at home because she has to take care of her family; therefore, she has less productivity.. On the contrary, one professor commented that she receives a lot of support from her husband. She receives opinions about her projects and she can also discuss with her husband particular academic matters, or ask him some queries and this represents a benefit for her. She emphasized that she has enough time for research activities. This professor

devotes a large part of her personal time to do research, maybe because she does not have children and she is forced to use her personal time for doing research. Since the official time (40 hours) allotted by the university is not enough for all other activities such as administrative appointments, tutorship and teaching , and for maintaining SNI membership, this professor highlighted the need to spend part of her personal time on research. For this reason, this professor has one of the highest levels of productivity.

It is important to note that all professors have the same official amount of time (40 hours per week) allotted for academic tasks (teaching, tutorship, administrative appointment and research), and depending on their categories, they have 8, 12 or 16 hours of classes. However, the time that university guidelines allocate for them seems not to be enough. Most of the time, they need to devote part of their personal time to carry out research activity; however, it depends on their priorities and circumstances of each one of them.

On the other hand, some professors who are married with people who are not involved in academic activities claimed that it is difficult for them because their partners do not understand all the work that a researcher needs to do and sometimes they need to use part of their personal time for these types of research activities. They do not understand that professors have a lot of work and sometimes they need to work at home. A comment regarding this was:

**Professor 2:** There is a little bit of interference because sometimes she does not understand these kinds of activities related to research such as working extra time late at nights in order to fulfill research requirements...she is not familiar with research. (Own translation)

The participants do not seem to be affected by the marital status per se, which coincides with studies carried out by Faver, 1985; Kyvik (1990). What seems to be affecting more, rather than marital status, is the fact of having children and being responsible for housekeeping or other commitments. As I mentioned before, women tend to do the household activities and take care of children and men are most likely to have enough time to focus on their academic work (research). However, there are men who help at home and maintain a balance in the work and family. In this thesis, it was found that being married is not a factor that could be totally affecting productivity although one professor mentioned that the fact of having a partner who is not involved in the research environment may cause some interference. This result is similar to the work of Cole and Zukerman (1991) who found slightly negative impact of being married on scientific productivity.

### **Number of Children**

Three professors have dependent children and one professor has one adult son. It was observed that two of the three professors who have children, have low productivity but both of them have administrative appointments at the university and they dedicate their official time (time allocated by the university) to do administrative tasks rather than do research. The other one who has a newborn born baby is one of the most productive professors analyzed in the comparative table. Although professors argued that having children do not have any influence on their research activities, it was observed that having family matters, or giving part of their time to their children indirectly affect productivity output because professors spend time persistently with their family and children.

One female professor who has three children said that she has to deal with many responsibilities, doing academic activities such as: teaching and administrative appointments, research and motherhood activities. It was observed that this professor does not have enough official time for research matters and she does not use her personal time to deal with academic matters. This professor does not mix academic with motherhood activities. In other words, she does not spend extra time to do research because she has activities at home. She does research at work and she stays with her family after finishing job.

A parallel argument was stated by another female professor. She mentioned that women are always expected to be the principal caregivers to children and not the father. Then, women inevitably use their personal time that could be dedicated to research to take care of their children and family matters. Maybe, if some female professors didn't have children, they would use part of their personal time to do research. For this, the professor expressed:

**Professor 3:** Women get home and they have to do house chores, take care of their children, do homework with them and absolutely everything at home. So, women have to carry out their research only at nights when they are already tired. (Own translation)

One male professor argued that he also takes care of his child and he tries to make a balance with his wife in the house and with his child. It was observed that he has a high level of productivity on research. Besides, he is a professor who has doctoral degree and he has a lot of experience and research training unlike other professors who are married, have children, and do not have enough research training, in addition to the fact that his child is a newborn. As

we can observe here the difference is the research training each professor has or does not have. About this, he noted:

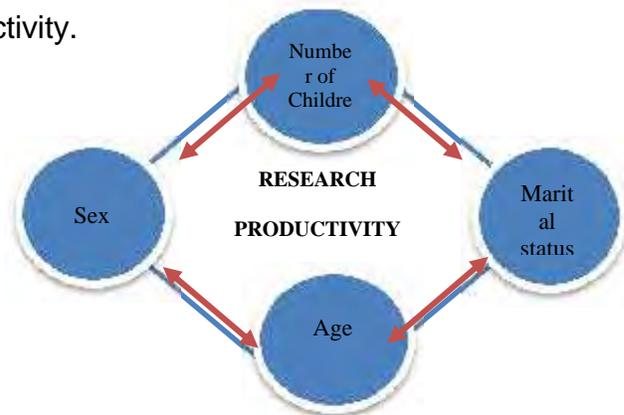
**Professor 5:** I have a newborn baby and she demands a lot of time and attention, overall I cannot sleep well when I help my wife with the baby care but I think up to now I have had a balance with that. (Own translation)

In this study, similar results to Stack (2004) were found. It was observed that women with children publish less than other women because, obviously, the time and the energy devoted to children can reduce productivity. In the case of men, they continue to be more productive than women with children because most of the time they do not have the whole complete responsibility of the children (Prpic, 2002). As one professor mentioned above, women are always considered the ones who have to take care of children.

The general findings in this work are similar to the ones by Long (1990), Kyvik and Teigen (1996) who found a significant negative impact of having children on women's scientific productivity. In this study women who have children were found to be less productive than women who do not have children. Having children causes a decline in research productivity, more for women than for men (Funchs et al., 2001; Hunter and Leahey, 2010), and therefore female researchers spend less time on research.

#### **4.2. Interpretation of the data**

In this section, a graphic model was designed to observe better the interactions among the factors. Bandura's theory provides an understanding of the human behavior and the theory suggests a combination of factors that influence people to behave in certain ways (Bandura, 1986). This author was interested in how certain factors influence the development and changes in human behaviors and he designed a model of the interaction process for behavior changes. For that reason, I created a graphic model in which it can be observed how some factors such as age, sex, children and marital status have an impact on productivity. Here, it is shown how the factors interplay among them and influence each other. Besides, similar to Bandura's model in which it is explained how people acquire certain behavior patterns that depend on factors, this model shows how some personal factors interact among them and in turn how they may affect productivity.



**Figure 4.** Factors affecting productivity adapted from Bandura's model

In the graphic model, there is a dynamic process in which all factors operate to affect productivity. The factors age, number of children and marital status should be taken in particular consideration because they are affecting the research output. However, the factor sex does not have any effect on the productivity. The fact of being

male or female does not affect the research outcome because it depends on people's own actions and the roles of being female or male in society. Being a male or a female determines the life-patterns of each person especially in cultures that have strong traditions. For example, if an individual was born female, she would be expected to grow up and become a wife and mother and to pursue domestic tasks, take care of the household and children.

Sex roles have become much less rigid in advanced cultures. There are new trends in which males and females are having different behaviors assigned because of sex (Park, 2009). Bandura (n.d) mentioned that every time women are joining the work force by necessity or personal preferences, they are the ones considered to make a balance in the house and in their occupations. So, women manage the family demands as well as their professional roles. They face different roles such as children care that might affect their well-being. Hence, sex does not make a difference in productivity but other factors that interact with it such as marital status and number of children and the roles inherent to the fact of being woman or man in our society. All factors operate through their effects on productivity. For example, if the professor is a married male with two children, he's likely to have a higher productivity than a married woman with two children because as Bandura mentioned, women are the ones considered to take care of children and household chores. Then, women's role could be reducing the time for doing research in this investigation, although, there are few men who also share responsibilities at home and with their children (Hyde and Linn, 1988; Linne and Peterson, 1985; Voyer and Al., 1995).

It was shown that being a woman or man without children does not make any difference in research productivity but if the person is married, there are different situations or multiple roles. Bandura states that women who work remain responsible for the household and child care responsibilities as well. Women also report more efficacious feelings than men in balancing work and home demands. What is important to mention is that the factor children causes a huge impact on research because women tend to have low level of productivity because they take care of their children, house and work, while most of men focus just on their jobs. Although, as I mentioned before, there may be some exceptions.

After considering the number of children, marital status and sex, we focus on age which is another important variable in this study. As we previously observed, productivity does not increase with age but professors gain experience through the years. Bandura (1981) mentioned that old age clearly involves gradual decrements in capacities even if the person has the control of his beliefs when is old age rather than young people. Control beliefs of aging people are generally higher than expected by younger people. In this investigation, it was observed that older people feel more tired to do research and this interferes with their academic work to carry out projects to their completion and increase the productivity. The majority of aging people are not pessimistic (Bandura, 1981) but the ravages of age are reflected in productivity.

However, previous studies (Bordons et al., 2003 Kyvik, 1991) have shown that the productivity of publications tends to increase according to the academic rank. The academic rank suggests a positive and progressively and stronger relation with

research productivity (Blackburn, 1978; Dickson, 1983; Centra, 1983; Harry and Goldner, 1972; and Michalak and Friedrich, 1981 and Kyvic, 1990).

Although this study does not confirm the presence of significant differences in productivity between the fact of being man and woman, it shows that the number of children is the factor which affects the most, and the differences are more noticeable when we consider the marital status and age. It is important to note that productivity could depend on other various factors that could be considered in further studies such as contextual factors and others such as motivation (goals, efforts), incentives (financial and recognition), time (constraints) and lacks (group work and abilities) (Dundar and Lewis, 1998; Kyvik, 1993; Ramesh and Singh, 1998).

## **CHAPTER 5**

### **CONCLUSIONS**

The aim of this study was to investigate the effects of the personal factors on professors' productivity in the University of Quintana Roo. Specifically, the study aimed at determining the relationship among sex, age, marital status and number of children with the research productivity of five participants. In this study, the indicators of professors' productivity were articles, books, chapters of books and proceedings.

The general conclusions were categorized into the four core factors: sex, age, marital status and number of children. Although the conclusions in this section are presented as solitary units, they can be interpreted properly and understood in combination.

#### **AGE**

Although the study confirmed a relation between age and productivity, the effect of age was not very important at all. Age was not a factor which seemed to affect productivity but the experience. Experience was a main factor because each researcher acquires it through the years and in turn the researcher increases his productivity. This result was consistent with Levin and Stephan's (1991) conclusions. They claimed that age had little power to explain research productivity (Stephan, 1996) and there were other factors that explain productivity better than age or life cycle effects.

#### **SEX**

Regarding sex, this study was consistent with Gupta, Kumar and Aggarwal (1999) and Bland, Center, Finstad, Risbey and Staples's (2005) studies in which they

agreed that there was not evidence that showed differences on productivity according to sex.

#### MARITAL STATUS

Marital status was a factor which did not seem to affect productivity and this was also consistent with some previous works by Faver, 1985; Kyvik, 1990.

#### NUMBER OF CHILDREN

The study concluded that researcher's number of children was the dimension that influenced the most research productivity due to the fact that researchers need time to be with their children and they prefer to spend time with them rather than to devote part of their personal time to research. The results therefore indicated that the presence of children would likely decrease research output. Although the isolated factor did not seem to affect directly productivity, having children and being the person who takes care of them totally affects productivity along with the fact of being married.

In spite of the fact that these core factors had effects on productivity, I would also like to direct readers' attention to one last point, the influence of the institutional context. The institutional context is an aspect that describes the influence of environmental factors on one's behavior. Institutional context effects can impact faculty members' lives and activities in many ways. As it was previously mentioned, productivity is evaluated and monitored at the University of Quintana Roo which acknowledges research as one of its main functions. Some of the policies at this university are the optional participation in some entities (National System of Researchers, the Faculty Development Program and the Incentive Program for Teachers). It is also a priority to strengthen academic capacities by consolidating research groups as well as to increase the category of

works. Summarizing, for the University of Quintana Roo, it is essential that professors enhance research productivity. Therefore, all of these factors in the context determine the roles and responsibilities of each faculty member. These factors may not come from inside the person himself (cognitive factors) but they would be generated by the overall institutional context that surrounds professors and strongly influence them.

The productivity is influenced by factors such as incentives (funding) to promote productivity (Rhoades, 2001). Among contextual factors which had a great impact on productivity in this thesis, was time. Professors at the university must devote at least eight hours to research activity and sixteen hours if they are full professor category and eight to sixteen hours to teaching. It also may be noted that professors are constantly evaluated once a year so they need to comply with their Annual Academic Plan<sup>3</sup>. This is the context of each professors working in the Department of Language and Education. An important point to mention is that the context and professional environment of the university affect professors' productivity and somehow that creates conflicts because although the university is an established institution, it entirely depends on government policies. It means that university depends on public resources to operate and undoubtedly universities and institutions context strongly influence positively the research productivity and productivity itself. Professors should fulfill all the requirements they are asked by their university though. The influence of context definitely may

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<sup>3</sup> A plan in which professors include their commitments regarding research, teaching, and administrative appointments among other academic functions they must accomplish.

stimulate the scientific productivity in the university otherwise professors could not have projects and research works every year.

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