2008

A Mixed-Method Study of the Environmental and Personal Factors That Influence Faculty Research Productivity at Small-Medium, Private, Doctorate-Granting Universities

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NOTE TO USERS

ABSTRACT

A MIXED-METHOD STUDY OF THE ENVIRONMENTAL AND PERSONAL FACTORS THAT INFLUENCE FACULTY RESEARCH PRODUCTIVITY AT SMALL-MEDIUM, PRIVATE, DOCTORATE-GRANTING UNIVERSITIES

by

Gustavo Gregorutti

Chair: Duane Covrig

ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

School of Education

Title: A MIXED-METHOD STUDY OF THE ENVIRONMENTAL AND PERSONAL FACTORS THAT INFLUENCE FACULTY RESEARCH PRODUCTIVITY AT SMALL-MEDIUM, PRIVATE, DOCTORATE-GRANTING UNIVERSITIES

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Date completed: March 2008

Problem

This study sought to determine what organizational factors and personal characteristics of faculty members most relate to research productivity at small- to medium-sized not-for-profit, private, doctorate-granting universities.

Method

A mixed methodology was used that included an online survey, follow-up email surveys, and two face-to-face interviews. The main statistical tools used were multivariate analysis of variance (MANOVA) and regression.

The final sample came from 12 small- to medium-size, private, not-for-profit doctorate-granting American universities. A group of 277 professors responded to the online survey. An online follow-up qualitative survey was conducted with 34 replies. Two additional face-to-face interviews were performed to complete this mixed-method study.

Results

The independent variables for this investigation were socio-demographic, career-achieved experience, self-knowledge, social knowledge, environmental conditions, environmental responses, social contingencies, and behavior. The dependent variable, research output, was the number of scholarly articles, books authored or coauthored, conference proceedings, and books edited within the last 2 years.

The multivariate analysis of variance indicated that the highest research productivity was among faculty with the following profile: ages 41 to 50, male, from science departments, having 6 to 15 years at a university, tenured, in some level of administration, ranked as professor, and teaching at both undergraduate and graduate levels.

The six constructs of factors for the regression model explained 50.1% for article production (q34) in the last 2

years and a 61.4% for articles in the whole career (q38), respectively. The main constructs producing regressions were self-knowledge and scholarly behaviors. This model explained 23.7% of the conference proceedings (q36). Models for books authored (q35) and books edited (q37) were not significant.

Qualitative data showed that: (a) human resources, such as good students and colleagues from the same fields, (b) lower teaching loads, (c) supportive and mentoring environments, and (d) clear expectations built into departmental mission statements were most helpful to create research productivity.

Conclusions

Both quantitative and qualitative results indicated a high relationship between self-perception and research productivity. Professors who were self-committed to advancing knowledge generated more scholarly work.

Recommendations, discussions, and suggestions for further studies are supplied.

Andrews University

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A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

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External: Duane McBride

March 3, 2008
Date approved

To my wife and children

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CHAPTER ONE

INTRODUCTION

Background of the Problem

A new entrepreneurial trend among private research universities has become visible since the 1980s. Many factors, such as escalating costs of labor and insurance, technological innovations, new government policies, and government budget cuts for higher education, have produced a greater demand for resources (Slaughter & Leslie, 1997). This increasing pressure is pushing universities to search much more aggressively for external sources of funding (Francis & Hampton, 1999). Universities are being compelled to generate new sources of revenue to accomplish their goals. Liaisons with businesses, corporations, and foundations are becoming a common occurrence at many doctorate-granting universities, whether public or private (Bok, 2003). At the same time, private corporations are supporting universities to enhance their businesses and access to markets (Slaughter & Leslie, 1997).

There has been a remarkable shift in the relationships between universities and industry and federal government (Powers, 2004). Government legislation such as the Bayh-Dole Act of 1980 has encouraged nonprofit organizations and even small businesses to retain the property rights to inventions derived from federally funded research (Powell & Owen-Smith, 1998). Thus, the commercialization of research is permitted and stimulated through patents and the profitable licensing of university/industry/government partnerships. The Bayh-Dole Act and many others were a response to external changes such as the end of the Cold War and the globalization that pushed government and business to new paradigms (Berman, 1998). Moreover, corporations and large businesses needed outside support to develop research and new technology transfer. According to Rosenbloom and Spencer (1996):

> Within the large corporations, there was growing recognition that firms had become much less self-sufficient in their ability to generate the science and technology necessary to fuel economic growth. 'What was once a race has become more like a rugby match.' They anticipate a 'diminishing role for corporate laboratories as the wellspring of innovation', and suggest that the 'seeds of new technological advance will probably sprout more often in university or government laboratories.' (As cited in Powell & Owen-Smith, 1998, p. 173)

These political and corporate shifts generated changes in the environment surrounding universities and triggered

"a second revolution" in higher education, as Etzkowitz, Webster, and Healey (1998) put it:

> The academic revolution of the late nineteenth and early twentieth centuries introduced a research mission into an institution hitherto devoted to the conservation and transmission of knowledge. Building upon the first revolution, the second academic revolution is the translation of research findings into intellectual property, a marketable commodity, and economic development. (p. 21)

This entrepreneurial environment is challenging the mission and traditional view of the university. The "ivory tower" model of the university, where knowledge is produced in a "pure" form, is no longer feasible (Duderstadt, 2000).

Universities are seen as boosters of economic development. At the same time, universities pursue linkages with outside resources to gain access to better facilities, increased budgets, ways to improve research programs, and financial stability (Becker & Lewis, 1992; Bok, 2003; Bowie, 1994; Callan & Finney, 1997; Duderstadt, 2000; Lapidus, Syverson, & Welch, 1995; Slaughter & Leslie, 1997). This new university paradigm focuses on a broader network of interdependent relationships in which government and industry-business serve as partners for knowledge production. This is also known as the "Triple Helix Model" (Etzkowitz, 1996).

Modern society depends on improvements that come from using knowledge to develop solutions to problems (Kezar & Eckel, 2000; Meyer, 2003; Ortega y Gasset, 1992). Faculty research productivity in terms of publications and externally funded projects is essential to achieving these improvements (Etzkowitz et al., 1998). Much of the research/knowledge is produced at top research universities (Bok, 2003; Powers, 2004; Slaughter & Leslie, 1997). However, some less-productive universities seem to struggle with balancing teaching and research. Often faculty members at these institutions are expected to teach a full load of classes while also working on research and publishing articles (Blackburn & Lawrence, 1995). In spite of these expectations, these institutions have differing levels of faculty productivity. It is crucial to understand both the personal characteristics of productive researchers and the organizational characteristics of a university that promote or discourage research productivity (Siegel, Waldman, & Link, 2003; Tien, 2000). Knowing, controlling, and managing these characteristics could accelerate the advancement of knowledge production and the improvement of universities and communities towards higher levels of excellence.

Statement of the Problem

Businesses, industries, and communities rely on universities as producers of knowledge. The faculty is central to the research process (Boyer, 1990; Braxton, Luckey, & Helland, 2002; Glassick, Huber, & Maeroff, 1997). Universities also reap benefits from producing knowledge, such as finding new sources of income, receiving donations, and expanding the opportunities available to students (Lee & Rhoads, 2004). Therefore, it is essential for administrators and policy-makers to unlock barriers that may hinder faculty research productivity (Middaugh, 2001; Vardi & Weitz, 2004).

Little has been written about the effects of organizational practices and the personal characteristics affecting faculty research productivity at small- to medium-sized doctorate-granting universities (Carnegie Foundation, 2007). By definition, these small- and medium-sized universities graduate at least 20 doctoral candidates each year. Research, therefore, is critical to the mission of these universities (Tien & Blackburn, 1996).

Purpose of the Study

The purpose of this study was to investigate the relationship of organizational environment and personal

characteristics of faculty members on their research productivity. The study was done on small- and medium-sized not-for-profit, private, doctorate-granting universities.

By using multivariate analysis, regressions and interviews this study added to the body of knowledge about factors related to faculty productivity through both quantitative and qualitative data.

Research Questions

The general question that guides this investigation is, "What are the environmental and personal characteristics that relate most highly to faculty research productivity at small- to medium-sized doctorate-granting universities?" Research questions derived from this main question are:

1. To what extent do different personal variables such as demographic characteristics and career-achieved experience relate to faculty research productivity?

2. To what extent do (a) environmental conditions, (b) environmental responses, (c) social knowledge, (d) self-valuation, (e) social contingencies, and (f) scholarly behavior relate to faculty research productivity?

Conceptual Framework

To formulate a conceptual framework for faculty research productivity, this investigation used the theoretical approach developed by Blackburn, Bieber, Lawrence, and Trautvetter (1991) and Blackburn and Lawrence (1995). Figure 1 outlines the conceptual framework of this study.

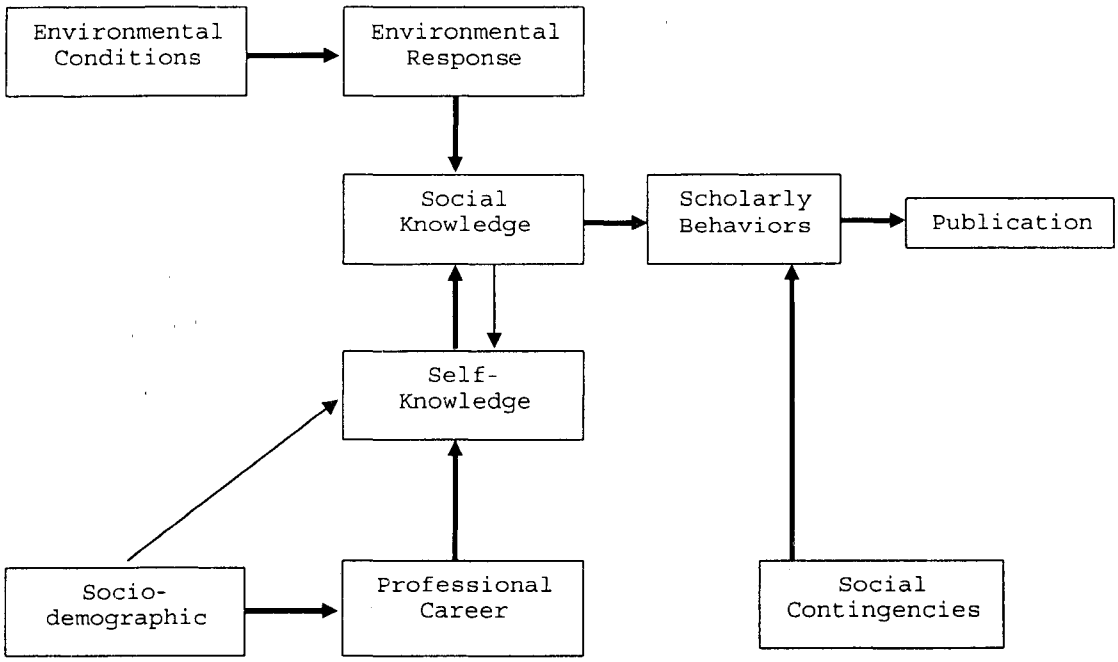


Figure 1. Conceptual framework. *The arrows indicate direct influence on the items they point to. From *Faculty at Work: Motivation, Expectation, and Satisfaction* (p. 27), by R. Blackburn and J. Lawrence, 1995, Baltimore, MD: Johns Hopkins University Press. Copyright 1995 by Johns Hopkins University Press. Adapted with permission.

Their study, *Faculty at Work*, a national survey originally conducted in 1987/88, explored faculty and administrators' perceptions of faculty research, scholarship, teaching, and service performance. This framework was selected due to its broad theoretical approach to relating personal and environmental variables to faculty research productivity. This present study, though, focuses only on research output as measured by the number of scholarly books, chapters, and articles published within the last 2 years.

Due to length constraints, the original "Faculty at Work" survey did not include variables for environmental conditions and social contingencies, although the conceptual framework recognized these to be important factors (Blackburn & Lawrence, 1995). However, this present study develops new variables, based on a literature review, to measure the effect of exogenous environmental conditions and social contingencies on faculty research productivity. The theory underlying this model is discussed in chapter 2.

Significance of the Study

A research area of increasing interest for administrators and faculty of private institutions is the challenges that doctorate-granting universities face to

maintain effective teaching and service while developing an identity for research.

Many studies address the performance of top major research universities in the United States. However, the small- and mid-sized doctorate-granting universities are much less studied, although they contribute to research (Mansfield & Lee, 1996).

There is a growing desire to understand how research is accomplished, under what conditions it may be stimulated, and particularly how organizational practices and faculty characteristics influence research productivity (Powers, 2004; Siegel et al., 2003). Moreover, these smaller universities need to enhance their research performance in order to keep up with a new model of the proactive university: a university that produces research to expand knowledge and enhance people's lives (Boyer, 1990; Glassick et al., 1997).

This research paper is intended as a contribution to untangling the effects that organizational environment and faculty characteristics have on faculty research output at doctorate-granting universities. Knowing, controlling, and arranging those factors could facilitate the development of higher education.

Faculty research productivity also triggers a domino effect that goes beyond research itself. Consider the following points:

1. *Enrollment and retention.* Universities with high levels of research attract more resources, such as investments for facilities, endowments, equipment for research, internal budgetary resources, grants, and scholarships for students (Lee & Rhoads, 2004). Research brings prestige and a broader recognition, making the university more attractive to good students (Dey, Milem, & Berger, 1997; Dundar & Lewis, 1998; Serow, Brawner, & Demetry, 1999). Universities and colleges that have various methods of helping students pay for college are more attractive to prospective students and are better able to retain students (Melendez, 1997; Tinto, 1987). Several studies have confirmed the importance of all forms of financial aid (i.e., grants, loans, and work study) as positive impacts on enrollment and retention (Braunstein, McGrath, & Pescatrice, 1999; Heller, 1999; St. John, 1990a, 1990b, 1993; St. John, Andrieu, Oescher, & Starkey, 1994).

2. *Teaching.* There has been an extensive discussion about whether the teaching-research integration produces positive results at the undergraduate level (Braxton, 1996; Kinkead, 2003). Colbeck (1998) found, through several

faculty interviews, that teaching and research are mutually supportive. The professors surveyed perceived benefits from integrating research with classes (p. 663). Braxton (1996) emphasized the importance of and benefits from that integration. In fact, Kim, Rhoades, and Woodard (2003) traced a significant correlation between the amount of money spent on research and the undergraduate graduation rates at public research universities. The integration of research and teaching can potentially benefit students through "active learning" (Braxton, Milem, & Sullivan, 2000). Nagda, Gregerman, Hippel, and Lerner (1998) found a correlation between research performed by undergraduate students and the retention of those students. This correlation was especially strong among African-Americans. Stack (2003) pointed out a significant connection between research productivity (number of publications) and students' evaluation of teaching. The students perceived professors who performed more research to be better teachers.

3. *Professional development.* Faculty research productivity opens the door to benefits such as tenure, rewards, higher salary, better reputation, and increased visibility, which in return link professors to more opportunities and resources (Creamer, 1998). A faculty

member who produces research and collaborates within and between institutions can be the main source of knowledge for an institution and a certain discipline, bringing prestige to that professor's department and university (Moore, Newman, & Turnbull, 2001).

4. *Industry and business*. Lee (2000, p. 114) gave the following reasons for industries and firms to collaborate with academics: (a) to solve specific technical or design problems, (b) to create new products and processes that would yield new patents, (c) to improve product quality and develop new technology to avoid negative environmental effects, and (d) to maintain relationships and network with universities to gain access to fundamental research and to recruit university graduates. According to Jankowski (1999), this collaboration is increasingly supported by the federal government and benefits both the university and business-industry.

5. *Employment and community*. Universities that produce research can be a benefit to surrounding communities by creating employment through spin-off, start-up, and other business opportunities that research can generate (Bessette, 2003; Jankowski, 1999; Powers, 2003, 2004). Research done at universities has made a significant contribution to humanity by solving problems; these

solutions may improve the quality of life for individuals, communities, and society at large (Bradshaw et al., 2003; Zucker, Darby, & Armstrong, 1998).

Research is a multi-dimensional activity that has multiple beneficial effects on professors, students, universities, and surrounding communities.

Definition of Terms

Doctorate-granting Universities: According to the 2005 Carnegie Classification (Carnegie Foundation, 2007), these institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate level. They award at least 20 doctoral degrees per year overall. These institutions can be subdivided into two large groups. The first group includes comprehensive doctoral universities with or without a medical/veterinary school. All these institutions offer a wide set of doctoral programs grouped as follows: (a) humanities and social sciences dominant (HSCD); (b) science, technology, engineering, and mathematics (STEM); and (c) professional fields other than engineering (PD). The second group of universities is delimited by the "center of gravity" of their doctoral program. This means these universities are either HSCD-, STEM-, or PD-oriented,

although they may also offer professional education at the doctoral level or in fields such as law or medicine.

Private universities: According to the 2005 Carnegie Classification (Carnegie Foundation, 2007), there are two types of private universities: not-for-profit and for-profit. This dissertation focuses on the not-for-profit universities. Based on knowledge production levels, these private institutions can also be subdivided as research universities (very high research activity), research universities (high research activity), and doctoral/research universities.

Personal characteristics: According to Blackburn and Lawrence (1995), personal characteristics of faculty members are independent variables that can affect their access to opportunities, commitment to research, and performance of research. Five categories of personal characteristics are considered in this study:

1. Socio-demographic: These variables include personal details such as gender, race, and age.

2. Professional Career: These variables are related to a faculty member's professional life, such as publication record, specialization, rank, length of career, tenure status, and administrative involvement.

3. Self-Perceptions: This is the self-image that a professor has regarding his/her research abilities, self-efficacy, general competence, commitment to research, motivations, and values.

4. Social Perceptions: These are dynamic variables referring to the interaction of self with one's institutional perceptions, which create the motivational basis for scholarly behaviors.

5. Scholarly Behaviors: These are activities such as giving conference presentations, submitting proposals for funds and grants, reviewing articles and discussing research topics with other colleagues, and submitting articles for publication.

Environmental characteristics: According to Blackburn and Lawrence (1995), these independent variables include exogenous factors such as the following:

1. Environmental Conditions: These variables describe the type of institution in which the faculty member works, including location, mission, and assets such as endowment, grants, external funding, equipment, and library size.

2. Environmental Response: These variables measure whether faculty perceive the institution as promoting research productivity through contributions such as

secretarial support, rewards, research assistants, funds for travel, etc.

3. Social Contingencies: These variables characterize events and crises that may affect faculty members and can affect research productivity. Examples are illness, financial or marital crises, and the birth of a child.

Faculty research productivity: This dependent variable measures the specific publishing outputs of faculty members, such as articles and book chapters published and books edited. These productivity measures are also related to later stages of organizational procedures, beyond the scope of this study, where research in translated into technology transfers such as patents, licensing, and start-ups.

Delimitations

An important delimitation of this investigation is its focus on one aspect of scholarship, the discovery of knowledge, while it excludes other dimensions of faculty productivity such as teaching and service. This study focuses only on faculty perceptions and does not take into account various administrators who are closely involved with the professors. Also, the factors studied include

certain influences on faculty research productivity, but exclude some other potentially valid variables.

There are several dimensions to research productivity's effects on and interactions with government, industry-business, and universities. Then: this study intentionally focused on the doctorate-granting universities' process of knowledge creation in the form of published studies, particularly, how faculty members' perceptions of themselves and their environment influence their ability to perform as researchers. This study did not include factors that produce financial returns from faculty members' inventions, such as technology transfer, partnership with industries and business, and various legal issues.

Due to time and length constraints, the universities selected for study were only private, not-for-profit doctorate-granting universities. This study did not consider the hundreds of large public and top private institutions with very high levels of research activity (Carnegie Foundation, 2007).

Figure 2 shows how the parts of the system interact; it also shows the variables selected for analysis.

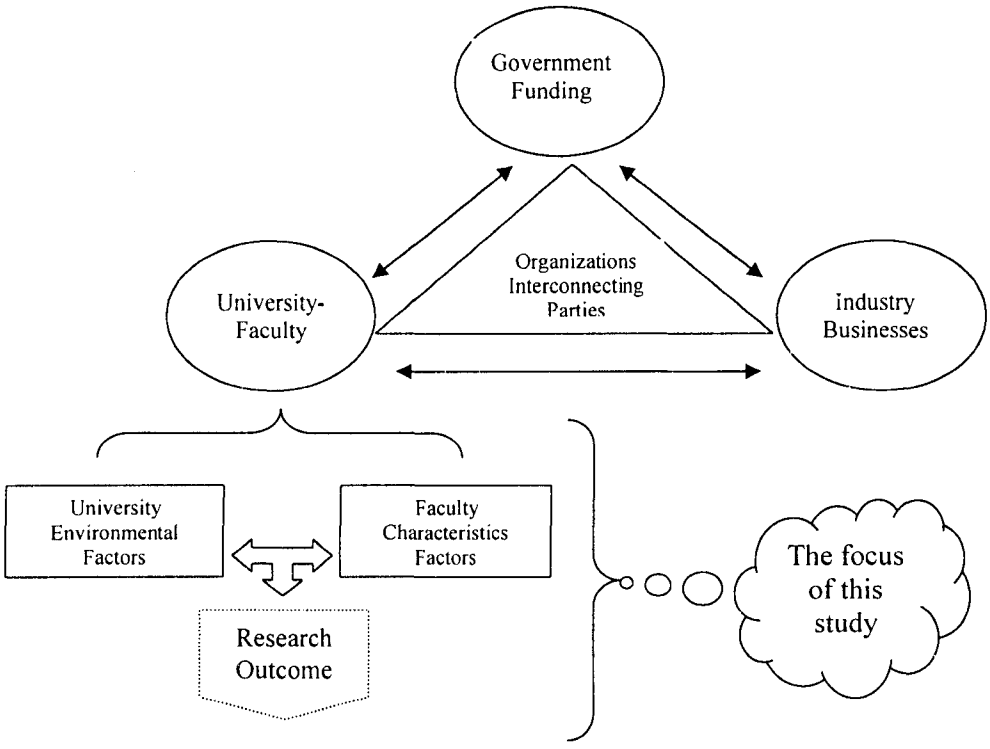


Figure 2. Focus of the study.

Limitations

Although the dependent variable used in this study, number of publications, is widely accepted as an indicator of faculty research productivity, there are some important limitations. First is the understanding of what constitutes "professional writing." Some professors' differences in interpretation may blur the results of this study by including papers that are not "professional" publications. Second, the accuracy of responses depended on the extent to which faculty could recall the number of writings published

during the last 2 years. Third, the dependent variable emphasizes quantity of publications without regard to quality. Data on the difference and influence of the writings, the selectivity of the review processes, etc., would be nearly impossible to collect and analyze for a sample this large. Fourth, the collection of data was based on a static design, a snapshot of the reality and perceptions of faculty within a given university. A more complete understanding of faculty research productivity could be gained through a longitudinal process that includes several moments in time, which is beyond the scope of this study.

CHAPTER TWO

REVIEW OF LITERATURE

Dimensions of Research Productivity

Over the last 15 years, there has been increasing concern about the mission and future of higher education. Every year universities are becoming increasingly influential institutions in the new globalized society (Etzkowitz, 1996; Etzkowitz, Webster, & Healey, 1998). The economies of the United States and other countries are fueled by new knowledge that translates into expanding opportunities for new generations (Kezar & Eckel, 2000; Meyer, 2003; Ortega y Gasset, 1992). It is also true that universities are becoming entrepreneurial to survive and prosper within a continually changing environment (Becker & Lewis, 1992; Bowie, 1994; Callan & Finney, 1997; Duderstadt, 2000; Lapidus et al., 1995; Slaughter & Leslie, 1997).

In short, universities are in a compelling situation in which it is critical for them to achieve a balance. On one hand, higher education needs more resources to cope

with increasing costs; many of the traditional sources of income, such as state support and federal grants, are diminishing. On the other hand, new missions of a knowledge-driven economy and society are also creating confounding paths through a transition that seems never-ending (Middaugh, 2001). The modern economy depends on the discovery of new solutions for real problems, and universities are having a huge effect on employment opportunities, new business opportunities, and quality of life (Mansfield & Lee, 1996). But in doing so, institutions also have to cope with new tensions and threats that may affect faculty productivity.

The Impact of Research

An increasing university-industry collaboration toward for-profit purposes is making significant contributions to the economy and to society. Bradshaw et al. (2003) observed that these trends are altogether positive:

> The university knowledge base can serve as the intellectual capital supporting industrial growth, providing the foundation for applications and ongoing research, which provides an expanding job market for students trained in the new field, and ultimately the commercial application of the research through new or improved products, processes, or regulatory procedures. (p. 297)

Bradshaw et al. (2003) pointed out that there are at least three positive benefits of university-industry collaboration (p. 298):

1. *Knowledge benefits*. Knowledge is the major contribution that universities bring to industry and society; whether that knowledge is applicable is another issue.

2. *Employment and skill benefits*. Students and society in general benefit by acquiring new skills through university-industry integration. This leads to job creation and social improvements.

3. *Technological application and product innovation benefits*. The development of new technological solutions is an incremental benefit of the innovations that students and professors, before and after graduation, develop to enhance businesses.

Technology transfer has been of considerable influence beyond universities' walls (Bessette, 2003; Jankowsky, 1999; Powers, 2003, 2004). Lee (2000) explored the type of benefits faculty and industries seek from each other, as shown in Table 1.

Table 1

Motivations for Research Collaboration

Rank	What firms seek from academics	Rank	What academics seek from firms
1	Research on product development	1	Secure funds for graduate assistants and lab equipment
2	Conduct 'blue sky' research in search of new technology	2	Gain insight into one's own research
3	Solve technical problems	3	Field-test application of one's own theory
4	Design prototypes	4	Supplement funds for one's own research
5	Provide seminars and workshops	5	Assist university's outreach mission
6	Conduct fundamental research	6	Create student jobs and internships
7	Support universities	7	Gain knowledge useful for teaching
8	Develop software	8	Look for business opportunity

Note. From "The Sustainability of University-Industry Research Collaboration: An Empirical Assessment," by Y. Lee, 2000, *Journal of Technology Transfer, 25*(2), p. 130. Copyright 2000 by Kluwer Academic Publishers.

Although industries are more oriented toward the application of research, and academics are more opportunities for basic research and idea generation, academics also need opportunities to secure resources and test research. According to Lee and Rhoads (2004), institutions involved in research can secure more financial

support as they see and work on leveraging their knowledge for application.

> Entrepreneurialism is particularly beneficial for institutions confronted with decreasing revenue. Faculty at research universities who bring in substantial funds can subsidize an institution's operating costs and administrative salaries, allowing a university to maintain its course or even thrive in the midst of declining endowment income and/or government cutbacks. (p. 741)

Finally, the transference of technology into market-driven industries has been boosting economies both within and beyond the United States (Bell, 1996; Etzkowitz et al., 1998; Fisher & Atkinson-Grosjean, 2002; Slaughter & Leslie, 1997).

The link between universities and business-industry is widespread and is likely to increase in coming years (Anderson, 2001). Since this collaboration is stronger and is becoming a defining feature rather than merely a trend among research universities, the reactions of professors and administrators to these new extra missions for universities are varied.

Criticism and Conflicts Regarding Research

The production of knowledge and in particular the translation of knowledge into money are not without criticism. Faculty must produce in an environment of conflicting concerns. One of the most repeated concerns

regarding universities engaging in entrepreneurial activities is the conflict of the missions, values, and cultures of businesses and academia (Bleiklie, 2005; Bleiklie & Powell, 2005).

According to Campbell (1997, p. 359), there are at least three areas of conflict. First, there is the potential conflict of interest. The use of funds, patents, and licensing, and influences such as ownership of stocks, may mix federal and private monies in the development research, which in turn benefits industry and business. Campbell asks, "Is it appropriate for faculty to act as entrepreneurial, holding patents and starting spin-off-companies, when they are drawing a full-time salary from the institution?" (p. 359). In other words, how do professors use their time and resources when they are paid for a certain performance? It is likely that "industry-university temptations" of making money from inventions would create a conflict of duty.

Second, there is the potential conflict of commitment. To balance teaching, doing research, and serving the public is difficult for most faculty members. It is possible that accumulating resources for the university and for the professor's pocket, while not bad in itself, may also

diminish their focus and effectiveness in teaching and public service roles.

The third potential conflict is that of internal equity. Academic departments that are less able to attract external funds from business or industries often are downsized or face budgets reductions (Slaughter, 1993). Professors' academic workload may be reduced in light of collaborative activities with industries. The professors involved in collaboration make more money for a smaller workload at their universities. The comparisons and special treatment within departments are an endless source of conflict.

Hackett (1990, p. 266) found that changes in organizational culture related to university-industry collaboration have brought at least seven value conflicts for science researchers, as follows:

1. *Freedom and autonomy versus accountability and direction*. This is the difficult balance between having freedom to publish and express ideas freely and feeling the pressure of potential consequences that knowledge has produced for industry and society at large. Industries tend to control their subsided research from being freely published. This, for instance, ensures their profit over competition.

2. *Producing research results versus educating students*. Professors and even administrators find themselves facing tough decisions about setting priorities and how to spend resources. Research can be a "money maker" for universities and professors, overthrowing teaching activities.

3. *Local versus cosmopolitan orientation*. Faculty members rely on institutional organizations such as centers of research to get funding for their projects. This relationship is strong, leading faculty to become more dependent on their local university. At the same time, industry is pulling faculty members toward broader relationships outside of the university, to the region, state, nation, or even global concerns.

4. *Quality versus quantity*. Some system incentives reward high-quantity performance. Such systems may deemphasize the need for quality in research.

5. *Specialization versus generalization*. Research requires specialization, but education involves generalized learning. It is difficult to bring diverse approaches to an integrated relationship among scientists, as researchers tend to focus on a narrow field of study.

6. *Competition versus cooperation*. Cooperation among faculty members from different universities may mean that

they lose projects. This leads to the isolation of individual universities.

7. *Efficiency versus effectiveness.* Since financial shortages are common, faculty members are pressured to use funds to achieve the highest possible level of research productivity. This tendency toward efficiency rather than effectiveness can waste resources and make both faculty and universities less productive of good.

Another source of conflict is the importance given to basic and/or applied research. Basic research is frequently associated with long-term inquiry, whereas applied research is more focused on solving immediate problems and business needs (Anderson, 2001, p. 240). This focus on applied research can conflict with the mission of higher education and raise questions about public-private accountability (Francis & Hampton, 1999; Milem, Berger, & Dey, 2000).

Campbell and Slaughter (1999) found, in a study of 86 colleges and universities, that university-industry collaboration also produces conflicts between faculty and administrators, since the latter treat professors as industrial managers would. As a result, faculty members lose ownership of their inventions and autonomy over their professional activities (p. 310). However, the same authors discovered that the most rigid tension between faculty and

administrators was the conflict of commitment. Professors want to keep their autonomy to increase their income and prestige. Being loyal to a local institution may limit scholars in their own professional businesses, because, as Ylijoki (2003) commented, "it is not easy to serve two masters simultaneously" (p. 332).

Faculty at Research Universities

Knowledge production is an overwhelming priority among faculty at top universities, as Serow et al. (1999) pointed out:

> No sector within higher education has been more closely linked to the movement away from teaching than the research universities, the 125 institutions that award large numbers of doctoral degrees and that receive the heaviest volume of external research support. These institutions not only tilt their own faculty evaluation criteria toward research but, by virtue of their prestige and visibility, set a standard that ambitious institutions in other categories seek to emulate. (p. 412)

Evidently, faculty at research universities differ from their counterparts in other institutions (Blackburn & Lawrence, 1991, 1995, 1997; Boyer, 1990) in that they have broader limits and hold and fulfill a wider range of responsibilities (Finkelstein, 1984). Intrinsic motivations and extrinsic rewards play an important role in the teaching-research dynamic. Personal interests are powerful motivators, driving professors to do what they most enjoy,

as are the draw of wider recognition and the access to better resources that come as a result of becoming an expert in one's field (Clark, 1997; Massey & Zemsky, 1994; Serow, 2000). Recognition for teaching does not transcend the local campus, while research brings national recognition and more personal and departmental resources, among other benefits (Fairweather & Beach, 2002; Tang & Chamberlain, 1997). Massey and Zemsky (1994) suggested that institutions and faculty are seeking prestige, and thus are reducing teaching time at the undergraduate level (Winston, 1994):

> Our proposition is that as faculty place greater value on discretionary time, undergraduate teaching is accorded less importance. Put simply, those hours not used for teaching courses, for grading papers, or for meeting with students become available for research and scholarship, for consulting and other professional activities, and in most research universities, for specialized teaching at the graduate level. (p. 2)

Two categories of educators are emerging: first, the prestigious researchers who are well known and have greater income and autonomy, and second, the traditional teaching-oriented faculty. Campbell and Slaughter (1999) warned that the disparities between these two types of professors will increase in coming years (Lee & Rhoads, 2004).

Another effect on faculty productivity is the institutional evaluation-promotion system, including tenure

and career rank. This system is based on grants received and publications generated, and pushes faculty to spend more time on research and collaborative work with business-industry in order to fund their departments and graduate students (Blackburn & Lawrence, 1991, 1995; Boyer, 1990; Fairweather & Beach, 2002). The reward system of research universities is a constant affirmation of the importance of research for the betterment of faculty members and universities (Leslie, 2002). Tang and Chamberlain (1997) found, by studying several public universities in Tennessee, that administrator and faculty perceptions of teaching rewards were contradictory: "Administrators believe that professors' teaching effectiveness is rewarded, whereas professors do not" (p. 224). As Wolverton (1998) put it, "Outstanding teacher awards recognize only a small percentage of good teachers and usually carry little cash value and fleeting fame and punishment for poor teaching are rare" (p. 64). Simply put, faculty members know that being rewarded involves research productivity. This is a paradox because universities are supposed to be places of teaching, but teaching is time taken away from research, and research is a key issue for career advancement. Professors who are researching or working with industry may have difficulty finding time to teach classes

effectively. Therefore, with resources coming in from research sponsors, professors give graduate students financial assistance in exchange for the graduate students' help with research or teaching (Slaughter, Archerd, & Campbell, 2004).

College students have a paradoxical perception of teaching quality, as Grunig (1997) pointed out:

> Faculty with high research and publication outputs are regarded as being more effective educators than faculty engaging in less research. In turn, the perceived excellence of faculty may contribute to enhance undergraduate educational reputation....Yet despite the potential decreases in student satisfaction that can be a side effect of institutional research activity, most students, like other members of society, believe that institutions that strongly engage in research are superior in important ways to institutions with lower research outputs. (pp. 42, 44)

Many of the undergraduate students are attracted to these top schools because of star professors or well-known researchers. However, there is a poor connection between those professors and undergraduate students (Grunig, 1997; Lincoln, 2000).

Time devoted to teaching seems to be negatively correlated to research effort (Lee & Rhoads, 2004; Patrick & Stanley, 1998). Marsh and Hattie (2002) statistically confirmed their previous investigation (1996) with the following findings:

> It is important to recognize that teaching effectiveness and research productivity are not naturally complementary.... We maybe should accept the conclusion that teaching and research are unrelated and move on to ask how we should enhance this relation. Good researchers are neither more nor less likely to be effective teachers than are poor researchers. Good teachers are neither more nor less likely to be productive researchers than are good teachers. There are roughly equal numbers of academics who—relative to other academics—are: (a) good at both teaching and research; (b) poor at both teaching and research; (c) good at teaching but poor at research; and (d) poor at teaching but good at research. (pp. 632, 635)

With data gathered in the 1992-93 National Survey of Postsecondary Faculty, Fairweather and Beach (2002) explored the percentage of faculty who were productive both in teaching and research. They found that only 22% of all faculty were simultaneously highly productive in both teaching and research. This percentage dropped to 6% when corrected for collaborative/active instructional approach to teaching quality. It is highly difficult for faculty to achieve teaching and research at the same time; as Fairweather put it, "the complete faculty member is rare" (p. 44).

According to Leslie (2002), moving to an institution with lack of pressure to publish would lead to a clustering of a certain type of professor. Such professors

> Tend not to trade teaching for research, even knowing that higher pay comes with publication if they had the opportunity. Given a reasonable level of security and

> compensation, faculty, on the average, would prefer to teach and to be rewarded for teaching than to seek opportunities for higher pay if it means doing more research and publication. (pp. 69, 70)

This means that the institutional characteristics (such as mission, incentives, and rewards) and intrinsic motivators are important conditioning factors that shape faculty preferences (Blackburn & Lawrence, 1991, 1995).

Some Determinates of Research Productivity

Faculty Attributes and Conditions

Several researchers have studied the dynamic between faculty and university in terms of research productivity. Some of the most renowned investigations are organized as follows.

Gender and minorities

According to Sax, Hagedorn, Arredondo, and Dicrisi (2002), female professors are generally less productive, although there have been significant improvements in research productivity of women that have narrowed the gap (Fox, 2005; Toutkoushian & Conley, 2005). Women make up one-third of faculty members nation-wide and are underrepresented in the more prestigious institutions. Long, Allison, and McGennis (1993) discovered that women are less likely to be promoted and are expected to meet

higher standards for promotion, especially in prestigious departments. In a more recent study, Xie and Shauman (1998) found that the productivity gap between men and women has decreased over the last two decades. They discovered that the disparity in research productivity corresponds to differences in personality or personal characteristics, as well as to different organizational positions with different access to resources for research. Sax et al. (2002) supported the same finding:

> Women publish less in part because they are less driven by a desire to produce numerous publications and receive professional accolade. It is quite possible that for many women, time not spent publishing is spent instead on projects or other activities perceived as having more direct societal impact. (p. 436)

Vasil (1996) studied the impact of perceptions of self-efficacy on research publishing. Vasil contrasted male and female faculty members at selected New Zealand universities. Men were found to have stronger self-efficacy perceptions, which promoted research productivity. Specifically, men had greater confidence to shape the "rules of the game." In other words, men had more control over resources and power structures, enabling them to produce more. This greater control promotes self-efficacy in male faculty members and weakens females' self-efficacy perceptions. Brown, Lent, and Ryan (1996) found that

efficacy perceptions affect one's ability to transition from research training to publishing. This effect is stronger among women, who are more prone to be affected by self-efficacy perceptions in a given environment.

Women faculty members tend to be located at community colleges or 4-year colleges and in the non-sciences/non-engineering departments, where resources for research are fewer (Gander, 1999). Long and Fox (1995) confirmed that women and minorities have traditionally been behind in terms of earning doctorate degrees, particularly in scientific disciplines (Johnsrud & Des Jarlais, 1994). This situation makes them less productive in research publishing, since scientists are the most prolific researchers. This condition prevents women and minorities from being leading generators of knowledge, as the same authors described:

> The pattern of lower proportions of women and blacks in universities merits attention because it is in these institutions that human and material resources are available to support research with equipment, libraries, graduate student assistantships, and collaborators. These resources in turn affect research productivity and ultimately scientific stature. (Johnsrud & Des Jarlais, 1994, p. 51)

Confirming these trends, Bradley (2000) conducted a longitudinal study of university graduation based on gender and found that women are more likely to graduate from

education, arts, humanities, social sciences, and law, while men are more likely to graduate from natural sciences, mathematics, and engineering. Men's traditional fields of study are linked to resources that allow men to be more productive in research. Creamer (1998) arrived at a similar conclusion and stated that "stratification in science, or the concentration of women and minorities in the lower ranks and at less prestigious institutions, cannot fully be justified by the assumption that impersonal, universal criteria are equitably applied" (p. 3). In other words, there are some differences in access to resources and advancement opportunities for minorities and women. Kolpin and Singell (1996) arrived at a similar conclusion:

> The research productivity of a faculty member is not simply a function of individual skills but is also affected by the 'quality' of colleagues, it is not surprising that some studies have found women tend to publish less than men. (p. 421)

The same authors found, among economics faculty, that departments with high-ranked faculty research publishing were the least likely to hire female faculty members. Perna (2001) remarked that a balance must be found to allow all segments of faculty, including women and minorities, to have equal opportunities for research productivity:

> If research performance is to continue to be a predominant criterion in an institution's faculty reward system, then individual colleges and universities must ensure that women and minority faculty have equal access to the experiences and opportunities that have been shown to promote research productivity. Particular faculty experiences and responsibilities that should be examined are the time available for research, the magnitude of the teaching load and the teaching level, the availability of support for securing funded research projects, the level of advising and service responsibilities, and the availability of support to facilitate completion of the doctoral degree. External barriers to research productivity (e.g., lack of graduate assistants, inadequate work space) must be eliminated and effective research behaviors must be nurtured so that the time spent on research more readily translates into valued research products (p. 564).

Sax et al. (2002) explored family-related factors, like childrearing, and did not find them to prevent women from being productive in research; women facing these factors actually published more, on average. Stack (2004) also noticed that women with children produce more research publications. Similarly, Fox (2005) reported that women with preschool-aged children were more productive than those without children or with school-aged children. However, in social sciences, women with children under the age of 2 were less productive in research than the women with older children. Bellas and Toutkoushian (1999) found that married faculty members are more productive than unmarried ones. Nevertheless, female scientists are less

likely to be married, yet they are among the most productive women-scholar groups (Long & Fox, 1995).

Faculty age

The age of faculty members does not seem to be a limiting factor for research productivity (Battersby, 1993; Blackburn & Lawrence, 1995; Lawrence & Blackburn, 1988). According to Perry, Clifton, Menec, Struthers, and Menges (2000), older professors see themselves as having slightly more research expertise, which helps them in their studies. Goodwin and Sauer (1995) studied 140 tenured economics faculty members in seven research-oriented academic departments. They discovered that research productivity increases rapidly in the initial stages of a career, peaks at the tenure review, and then begins to slowly decline. The same authors pointed out that one of the most important factors leading to a decline in publishing activities for a faculty member is to go into administration. Highly productive researchers promoted to some kind of administrative position usually never return to their previous level of publishing productivity, even if they leave administration and go back to research. According to Hu and Gill (2000), older senior professors may be more productive "due to favorable teaching loads,

opportunities to work with multiple junior faculty members and doctoral students on research projects, or more time for research activities due to fewer new preparations for classes" (p. 24). In an early study of science researchers, Levin and Stephan (1989) noticed that age is a weak predictor of performance, as they asserted, "The graying of America's scientific community was accompanied with slowed rates of research in higher education" (p. 545). In short, as stated by Collins (1993), it is very difficult to generalize about the relationship between age and research productivity.

On a related note, Smeby and Try (2005) concluded that although aging of individual faculty members may be accompanied by a decrease in productivity, combining of older faculty members with younger ones can have a positive overall effect. Senior professors have more prestige and stronger research records, which help them to get more funding from grants. The different age groups benefit from each other as part of a research team within a departmental structure.

Rank and promotion

Long et al. (1993), among others, remarked that the rewarding system of tenure is based on research

productivity. Moving up the rank classification is regarded as an important accomplishment among professors because it brings tenure, prestige, and stability.

Tien and Blackburn (1996) studied the relationship between rank and faculty productivity to see whether the promotional rank system motivated faculty members to produce more or less research. They found that tenure is not the only or most powerful motivator for faculty members to produce research. After obtaining tenure, professors continued to produce, and, in some cases, at even higher levels. Tien and Blackburn concluded "that motivation toward research productivity is neither purely intrinsic nor purely extrinsic. Rather, both appear to operate depending upon the circumstances of the individuals, their values, and the social situation of the moment" (p. 19).

Similarly, Hu and Gill (2000) found that tenure status, academic rank, and school type did not correlate with faculty research productivity. However, Dundar and Lewis (1998) discovered in almost all fields a significant relationship between the percentage of full professors in a department and the level of research productivity. McElrath (1992) found among criminology and criminal justice faculty that women were three times more likely to interrupt their careers for a spouse's employment than for maternity.

Situations like these made it more difficult for female faculty members to have continuity in their jobs, and continuity is associated with research productivity. The same study found that women with more career interruptions were less likely to be tenured. Tenure was associated with increasing quality and quantity of journal publications. On the other hand, career interruptions did not affect publication productivity and likelihood of being tenured for males. The males' higher productivity significantly reduced the time necessary to become tenured. Toutkoushian (1999) noticed that "even after taking into account various types of faculty publications, academic experience, educational attainment, field, and other commonly-used factors, women are less likely than men to be found among tenured faculty, and especially in the full professor rank" (p. 691).

Long et al. (1993) noticed that faculty with degrees from prestigious departments and universities were more likely to have a more prestigious academic job, which would yield access to better resources and opportunities; however, these factors did not predict promotion. Also, working in a highly prestigious department was more likely to reduce the chance of promotion to full professor for women but not for men.

Long et al. (1993, p. 714) observed that married faculty members had a 55% greater chance of being promoted from assistant to associate professor. Perna (2005) found a positive correlation between men being married and receiving rank-promotion; married men tended to be more respected. However, tenure promotion is not related to whether a professor has children (Perna, 2005).

Motivations and personality

Highly productive faculty members seem to have self-perceptions that reinforce their scholarly work (Blackburn et al., 1991). Perry et al. (2000) also noticed that newly hired professors were more prolific when they had a "perceived control entity," meaning a positive self-perception about their ability to produce research. Moreover, this perceived control can be potentiated or belittled by the community of scholars at each university, leading to higher or lower levels of productivity.

Tien (2000) conducted a study of Taiwanese faculty and their motivations to produce research. She found that faculty who think promotion and satisfaction of curiosity are important tend to publish articles; faculty who want to demonstrate their mastery tend to publish books; and

professors who care more about personal income are more likely to seek and receive grants.

Hunter and Kuh (1987) studied prolific academic writers and found at least five common personal characteristics: (a) high standards for productivity, (b) task oriented, (c) curiosity, (d) need for recognition, and (e) adaptability (p. 454). Hunter and Kuh (1987) also arrived at the following seven conclusions regarding productive writers:

1. *Prolific scholars are motivated by an authentic enjoyment of research activities.* Although the knowledge production is sometimes painful, these faculty members take pleasure in producing new discoveries.

2. *Scholarly success is enhanced when a researcher is helped by a sponsor.* A mentor is an important source of stimulation for potential writers to produce more. This guidance is especially valuable for new professors.

3. *The careers of prolific scholars do not follow a predictable or predetermined path.* There was not a clear course from high school to doctoral degrees, nor did the publishing follow a progressive, linear pattern.

4. *Prolific scholars recognize and take advantage of fortuitous opportunities.* They seem to have their minds set on using available opportunities to publish.

5. *A congenial work environment encourages research.* This includes (a) socialization through constant contact with colleagues engaged in research, (b) institutional support for investigation, and (c) incentive for those engaged in scholarly inquiry. Also, extended networks of colleagues through such professional associations as AERA and ASHE help faculty to get more involved in research.

6. *A sympathetic family and personal lifestyle contribute to prolific scholarship.* To be productive, many times personal and family time must be put aside. An encouraging and supportive spouse is very important for accomplishing tough publishing agendas.

7. *The 'write-wing' writers seem to have socialization experiences that promote the White male.* Cumulative advantages for men and cumulative disadvantages for women and minorities are a common denominator among professors. These patterns are more evident in employment, although they may begin before completion of a graduate degree.

Royalty and Magoon (1985) reported that counseling faculty members producing high levels of research, when compared to low-level producers, were more likely to have completed their doctoral degrees at a younger age, as well as to have performed some research while in graduate school. They also were more likely to feel that graduate

school prepared them for publishing, and to have perceived that others expected them to produce research while in school. The same study (Royalty & Magoon, 1985) developed a differentiation of personalities and environments that foster research. Three general types of researcher profile were noticed. "Investigative Personalities" like to conduct theoretical research, whereas "Social Researchers" tend to focus on more applied or practical investigations. "Artistic Researchers" are less structured and prefer methods such as case studies and qualitative methodology. Environments and personalities should be considered and combined to generate the best possible outcomes.

Levitan and Ray (1992) found that the most important factor in research productivity is the researcher's time-management ability. Working during all available hours is a key factor for a highly productive researcher. Top researchers feel they have a mission to accomplish and they enjoy their work. Having graduate assistants and low teaching loads can also increase publishing productivity among faculty members.

Institutional Attributes

Kelly and Warmbrod (1986) did a qualitative study of agricultural faculty and reported the following inhibitors

of research publishing: (a) a lack of quality teaching about or reflection on research components; (b) no time for research as the pressure of teaching responsibilities seemed great; and (c) little or no perceived support from an adviser or significant others (p. 31). Likewise, Copps (1984, as cited in Collins, 1993) referred to a study of 102 deans of nursing schools:

> The top five inhibiting factors for research productivity were 'lack of time, heavy teaching workloads, lack of preparation and commitment, lack of adequate funding or funding solely for teaching, and too few prepared or credentialed faculty members.' The top five facilitating factors, in rank order, were 'valuing and initiative by the dean, establishment of an administrative position for research promotion, seeking funding for research, adjusting faculty workloads, and directing revision of curriculum to emphasize research'. (p. 163)

Dundar and Lewis (1998) found that more faculty and more full-time faculty per department and program were strong predictors of output. A productive department relied on all of its scholars to do research. Better facilities and more resources also predicted a higher research output. High ratios of graduate students per professor, up to a certain point, and the research assistantships provided per professor were predictors of productivity. Meador, Walters, and Jordan (1992) found that research performance is enhanced by a larger department size, a private organization, greater grant support, a larger pool of

graduate students, and a quality research library. However, departmental size alone is not a significant predictor of productivity, according to a study of four major universities in Norway (Kvyk, 1995).

Kotrlik, Bartlett, Higgins, and Williams (2002) pointed out that productivity among agricultural faculty is a function of the number of doctoral students advised to completion in the last 5 years, faculty members' perceptions of their research confidence, and the number of graduate assistant hours allocated to the faculty members.

Private departments/universities tend to have greater research productivity. According to Perry et al. (2000), top research universities offer a better environment for research production than do liberal-arts colleges and comprehensive institutions. This longitudinal study found that institutional climate regarding research productivity is especially influential for newly hired faculty. In addition, research universities attract new faculty who are prompted towards high research productivity. Perry et al. (2000) point this out:

> Simply put, research productivity increased progressively in our new hires as a function of institutional emphasis on research, moving from those that placed least emphasis on research to those that value research and teaching equally or to research primarily. What these direct effects suggest is that research-oriented institutions not only appear to

> recruit faculty with certain control profiles, but that they also create environments that reinforce such dispositions. (p. 187)

In an early study, Allison and Long (1990) found that departmental culture regarding research is more important than hiring top faculty members. Professors tend to become more productive when they move to more prestigious departments that promote research; the opposite trend is seen among faculty members moving to less prolific departments. Smeby and Try (2005) pointed out that departments with a high proportion of qualified researchers attract other qualified and productive faculty. These departments have a highly collaborative climate that fosters teamwork. Long (1978), in an early study, also remarked that the prestige of the position did affect the scientist's later productivity. Professors at prestigious universities increased their research production independently of earlier publishing activities (Bodenhorn, 1997). Similarly, Long and McGinnis (1981) observed that professors appointed to new positions will conform to the characteristics of those new contexts within 3 to 6 years, regardless of their previous publishing records.

Powers (2004) called attention to an over-concentration of research productivity in a few "star scholars." Powers (2003) also found that transferring

technology and receiving royalties from patents and licensing are very difficult and depend on financial capital (money from different sources), physical capital (equipment, labs, buildings), human capital (the best scholars), organizational resources (research centers, technology transfer offices), and geographical location of the university (Audretsch & Stephan, 1996; Zucker et al., 1998). These resources are more likely to be located at biotechnology and engineering departments of top research universities (Albert, 2003; Siegel et al., 2003; Ylijoki, 2003; Zucker, Darby, & Brewer, 1998).

Furthermore, Owen-Smith (2005) found a growing connection between high-impact patents, which are a form of technology transfer, and publications. This relationship is "reflecting an institutional environment characterized by accumulative advantage across highly cited publications and patents" (Owen-Smith, 2005, p. 103). In other words, well-known, experienced professors will have greater impact on university-industry rapport. Keith and Babchuk (1994) implied that prestige among academic departments of sociology is associated with research productivity:

> Past prestige begets current prestige, with past prestige levels found to be more important in determining present perceptions of eminence than recent levels of scholarly productivity. While it is true that recent average faculty productivity is

> associated with subsequent perceptions of prestige, departments that have built reputations are viewed as eminent beyond that which can be explained by recent productivity.... The accumulated number of publications is strongly associated with measures of past prestige and recent scholarly output. (p. 24)

Conversely, Turk-Bicakci and Brint (2005) observed that universities with lower research performances had difficulties generating income from research.

Universities with mission statements and policies encouraging faculty to engage in grant-seeking and research have higher research outputs (Dundar & Lewis, 1998). Creamer (1998) pointed out that policies and rewards are important, but do not determine productivity:

> Institutional policies and practices contribute, but not determine, whether a faculty member initiates and sustains a substantial record of scholarly publishing. The institution plays the most significant role in helping a faculty member to sustain a commitment to publishing through a work assignment. Time devoted to research and interest in research are stronger predictors of career research productivity than the institutional reward structure, including salary. (p. 4)

Golden and Carstensen (1992) also noticed that teaching load is an important factor affecting faculty research productivity. Universities must create schedules that allow faculty members time and resources for research activities (Graves, Marchand, & Thompson, 1982). Olsen (1994) concluded that "universities cannot expect major

productivity gains from their faculty without redefining their roles in research or teaching" (p. 563).

Regarding graduate training, most students at research universities are strongly trained to become researchers, rather than educators (Fairweather & Rhoads, 1995; Marsh & Hattie, 2002). Austin (2002) remarked that graduate schools have a socialization effect upon graduate students that allows them to get involved in academic career activities, specifically research and publishing. According to Gelso (1993), graduate students' interest in doing research throughout their careers will depend on (a) early involvement in research activities, (b) high valuation of research approaches, and (c) the understanding of connections between science and practice. These influences come from schools, and the intensity of the influence depends on the specific school's cultural value of research. Phillips and Russell (1994) studied the relationship between training environment and research productivity among counseling students. They found positive relationships between (a) research self-efficacy and perceptions of the training environment, (b) research self-efficacy and research productivity, and (c) perceptions of the research training environment and productivity, particularly among advanced graduate students. In a more

recent study, Mallinckrodt and Gelso (2002) confirmed that research training environment (RTE) has a positive impact on career research productivity. This RTE effect has different outcomes depending on the student's personality.

Weidman and Stein (2003) arrived at similar conclusions when they studied doctoral students. They suggest that this unidirectional emphasis should also be applied to other needs, such as training teachers and even other professionals who are more oriented to professional "preparation for the changing workplace" (p. 95). Louie, Drevdahl, Purdy, and Stackman (2003) also discovered that "a relatively small portion of university resources are devoted to the development of faculty as teachers. Few university professors in any discipline receive pedagogical training to prepare them for the teaching task" (p. 150). The overemphasis on research as the main goal for doctoral students is a socializing factor that can make some faculty more research-oriented than others.

A Conceptual Framework for Research Productivity

The theoretical model upon which this dissertation is based is illustrated in Figure 1, previously discussed in chapter 1. The structural relationships of this model are built upon cognitive motivation theories and social

cognition theories to assess the influence of selected personal and environmental motivational variables on research output. These theories argue "that the manner in which people differentially assess their personal abilities and interest interacts with their perceptions of the organization's priorities (what it supports) and causes them to engage extensively in some activities and less frequently in other activities" (Blackburn et al. 1991, p. 388). Faculty members' research productivity results from interactions between their perceptions of their capabilities and their perceptions of their environment. Organizational characteristics enhance or undermine perceptions that affect faculty members' motivations to act in a certain way, in this case to produce scholarly publications (Bandura, 1986, 1997). Behaviors are, therefore, a product of dynamic interaction between self- and environmental-perceptions.

Blackburn et al. (1991) used need-motivation theory to explain how differences in gender and age affect productivity. They also used life-stage theory to elucidate age and changes over time that would affect a person's drive to accomplish research, and socialization theory to describe why Ph.D. recipients from top research universities will be less interested in teaching than

faculty members who graduated from a different type of university. Professors who graduated from universities that heavily underscore research as the main purpose of a Ph.D. were more prone toward research productivity instead of teaching.

The conceptual framework of this study uses the following variables: individual characteristics and environmental characteristics.

Individual Characteristics

There are five constructs suggested by Blackburn and Lawrence (1995) that affect faculty productivity.

1. *Socio-demographic variables.* These are personal background variables, including gender, race, and age. These variables influence an individual's access to career opportunities and the development of personal values and goals; therefore, they are first in the model (see Figure 1).

2. *Professional career variables.* These variables include the discipline and specialization of a professor; publication record, such as publications, grants, and rewards obtained throughout one's professional career; length of career; current rank; tenure status; level at which a faculty member is teaching; administrative

involvement that can take away time from research; and type of graduate school from which a professor received his/her highest degree, assuming that the socialization of training would modify values and mold perceptions of research and teaching (Long, 1978; Long & McGinnis, 1981). Career experience is a synonym for skills and wisdom acquired over time, and gives a professor certain advantages over others, which Merton (1968) called the "Matthew effect." This accumulated advantage helps productive faculty members to receive more resources and recognition even at early stages of their professional careers (Moore et al., 2001; Powers, 2004).

3. *Self-knowledge variables.* These variables characterize how faculty members view their own personal beliefs, professional self-image, self-efficacy, and competence in carrying out research (Blackburn & Bentley, 1993). According to cognitive motivation theories, individuals' understanding of themselves (e.g., their self-assessed competence, personality dispositions, efficacy, etc.) predicts how they perceive their environments (e.g., norms, resources, and restrains) more often than their environmental perceptions predict this self-understanding (Bandura, 1977, 1986). In other words, people are in charge of their conduct, although they are influenced and

conditioned by the environment. The individual attitudes and values assumed and developed by a faculty member regarding academic roles mediate the importance given to activities such as teaching, research, and service. Unlike sex, gender, and career, self-perceptions may change over time. As Blackburn and Lawrence (1995) stated, "Self-knowledge variables, while salient, fluctuate. Historical events over which I have minimal control (e.g., a financial crisis, a change in institutional priorities set by a new president, war—what we call environmental conditions) can influence them" (pp. 81, 82).

4. *Social knowledge.* This central concept includes variables representing the dynamic relationship between a faculty member's self-perception and his or her perception of the institutional environment, an interaction which produces an output, in this case publications. Cognitive theories support the assumption that environment shapes individual preferences directly through people, norms, goals, work expectations, and faculty roles, and indirectly through rewards or feedback on behaviors, as Blackburn and Lawrence (1995) explain:

> By a faculty member's social knowledge we mean her or his perceptions of various aspects of the work environment. Faculty form beliefs from experiences with other colleagues, administrators, committee decisions, faculty meetings, institutional rules and

> norms, and professional association practices.... These perceptions motivate their behaviors. In addition, faculty regularly test their social knowledge. They receive feedback on their behaviors (e.g., a merit salary increase after obtaining a grant; no merit increase for advising additional students). Some environmental responses confirm the currently held social knowledge. Other responses motivate faculty to revise their environmental perceptions and to modify their behaviors. (p. 99)

This active interaction of perceptions creates the motivation for faculty research productivity. The motivational basis for behaviors may change or be readjusted by a faculty member in a positive or negative way, which can affect scholarly activities.

5. *Behavior*. According to Bandura (1986), behavior is a product of self-knowledge and external sources of influence, and cognitive processes are key to deciding how and what things are important:

> Cognitive factors partly determine which environmental events will be observed, what meaning will be conferred on them, whether they leave any lasting effects, what valence and efficacy they will have, and how the information they convey will be organized for future use. Thought also provides the means for monitoring and regulating one's efforts to manage and shape the events of daily life. (Bandura, 1986, p. 454)

Behavior is the result of interacting effects of what Blackburn and Lawrence (1995) called self- and social-knowledge that generate the motivational basis of actions, as follows:

> Our theoretical framework postulates that motivations lead to behaviors, to activities in the domains of teaching, research, scholarship, and service. To the extent that they have options, faculty members will allocate interest, by self-knowledge concerning their competence and their chances of success, and by the social knowledge they trust with regard to what students, peers, and administrators value and reward. Presumably, then, that effort will lead to products. (Blackburn & Lawrence, 1995, p. 106)

Motivated faculty engage in activities such as dissertation and research involvement, grant-seeking activities, research seminars and lectures, and the like. In turn, these activities translate into publications such as scholarly journal articles and books, which compose the dependent variable.

Environmental Characteristics

These are the existing features and work-setting surrounding professors, separate from the faculty members' perceptions.

1. *Environmental conditions*. These exogenous variables are embodied by the institution in which faculty work: its financial support; mission related to teaching, research, and service; geographic location; student enrollment; teaching load; and structural conditions such as library, endowment, amount of money spent on research, and facilities. This construct was included in the original conceptual framework of "Faculty at Work," but was not

tested. This present study includes a new set of variables, based on literature review, to test environmental conditions as a predictor of faculty publishing output.

2. *Environmental responses*. These variables refer to how institutional responses support or hinder faculty research output. Examples of environmental responses are the type of reward system, the number of graduate assistantships that provide time for research, the evaluation emphasis, and the incentives for professors to accomplish research, among others. These environmental responses can be boosted by high levels of productivity, creating a feedback loop that affects not only the way universities work to enhance research, but also one's career record. Blackburn and Lawrence (1995) mention this:

> These responses operationalize the normative climate of the institution. The shared understanding of the institution's mission and of what is central to a particular academic unit in part shapes decisions about awarding tenure or committing institutional resources to faculty projects. (p. 18)

3. *Social contingencies*. This construct contains positive and negative events that may occur in the personal life of a faculty member, such as birth of a child, illness of a spouse, and financial stress, all of which can affect the behavior and the ability of a faculty member to produce research. These factors, although originally included in

the conceptual framework of "Faculty at Work," were not tested until Hughes (1996) expanded the survey. This current study tests the same group of constructs at selected universities.

Summary

Research universities, particularly less productive ones, need to create the best combination of personal and environmental conditions to enhance faculty, institutions, development of knowledge, and, in later steps, society at large.

This dissertation was intended to test part of the "Faculty at Work" model and as yet untested factors related to Environmental conditions. The dissertation is an important contribution toward building a theoretical model to explain faculty research productivity. The theoretical model could be particularly valuable to less-productive private research universities, since these universities have been shown to struggle with research productivity and have been understudied.

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

This chapter describes the research design, population and sample selected, data collection, instruments, and data analysis procedures. This study was undertaken to investigate how personal and environmental factors affect faculty research productivity at selected research universities.

Research Design

A mixed methodology was used to investigate the faculty's perception of how institutional environment and personal variables relate to faculty research productivity. A sequential model was most appropriate for the present research. It combined quantitative and qualitative methodologies. Creswell (2003) describes such sequential procedures:

> [These are] sequential procedures, in which the researcher seeks to elaborate on or expand the findings of one method with another method. This may involve beginning with ... a quantitative method in which theories or concepts are tested, to be followed

> by a qualitative method involving detailed exploration with a few cases or individuals. (p. 16)

This is an *ex post facto study*, often called a casual-comparative study. This type of research is widely used in the behavioral sciences. The independent variables cannot be manipulated or arranged (Creswell, 2003). It would be impractical or unethical to modify variables such as perceptions, personality, and culture values.

Exploratory qualitative data were collected through follow-up questions that respondents volunteered to answer. These were used as an understanding of faculty perceptions on issues influencing faculty research productivity.

Population and Sample

Following the 2005 Carnegie Classification (Carnegie Foundation, 2007), there were 39 small- to medium-size, private, not-for-profit doctorate-granting universities. These institutions were not comprehensive and therefore had an orientation on one of the following emphases: (a) humanities and social sciences (HSCD), (b) science, technology, engineering, and mathematics (STEM), and (c) professional fields other than engineering (PD). These universities were distributed in 18 states. Four of these 39 universities were classified HSCD, 8 as STEM, and 27 as PD. Eighteen institutions were independent; 21 were

religious or church affiliated. Two were located in rural regions, 18 in suburban areas, and 19 in urban or city settings.

According to the report of the Institute of Education Sciences of the U.S. Department of Education (2005), the number of part-time faculty has risen 43% since 1995. In addition, non-tenure-track faculty now account for 65% of the faculty population. Based on these facts, this study attempted to survey all part- and full-time undergraduate and graduate faculty members from all 39 of these doctorate-granting universities. It is noted below which universities granted permission and who participated in the survey.

Data Collection

Letters of invitation to participate in the survey were sent to the chief academic and institutional research officers at all the selected universities classified as small- to medium-sized, not-for-profit, private, doctorate-granting universities (Carnegie Foundation, 2007). All of these 39 universities were asked for permission to contact professors and for lists of professors' email addresses. The final number of universities and faculty members participating in this study depended upon their willingness

and cooperation. Only 12 universities gave permission to survey their faculty members, which represented 31% of these universities. Two of these 12 universities had a major emphasis on science, technology, engineering, and mathematics (STEM), and 10 emphasized professional fields other than engineering (PD). These institutions were located in the 11 following states: California, Florida, Illinois, Kentucky, Michigan, Minnesota, New Jersey, Oklahoma, Oregon, Pennsylvania, and Virginia.

The investigation started generating quantitative information through a modified version of the "Faculty at Work" questionnaire designed by Blackburn et al. (1991).

All professors at the 12 universities received an email, endorsed by the university's administration, with a link to access a web-based survey at Zoomerang.com (Appendix A). Faculty completed the survey anonymously online. The web-based survey received 711 visits with 277 completed questionnaires. A total of 25 surveys were discarded for being incomplete. The average response per university was 23. The lowest response was 7, and the highest 45. All the responses were collected and downloaded after 6 months and were processed with SPSS, a statistical software program. The compilation of information was from one point in time.

Using the emails of professors who wanted to participate in follow-up inquiries, a second set of open-ended questions was conducted to expand perceptions of environmental and personal characteristics. These questions explored and deepened quantitative findings. To accomplish this goal, a link to a new online questionnaire was sent through email to the reduced group of 67 faculty members from 12 universities who agreed to share more perceptions and opinions regarding research productivity. A total of 43 faculty members visited the survey, leaving 34 follow-up questionnaires completed, giving a response rate of 51%. This last survey had open-ended questions with blank boxes where professors expressed their points of view regarding research productivity. It also included a short set of background questions (Appendix A).

Finally, to further understand the dynamics between different research influences and research productivity, two interviews were conducted with professors who demonstrate successful research productivity at one selected university from the sample of 12 universities. The institution selected was placed geographically close to the researcher. This institution was classified as PD (professional oriented). The interviewees were full-time professors with extensive records of publications and

grant-funding obtained throughout their careers. The selection of these professors was based on references given by department chairs.

I conducted a set of 2 semi-structured interviews of approximately 20 to 25 minutes in length, giving each participant the opportunity to answer open-ended questions regarding faculty research productivity and its characteristics. Each participant was asked the following introductory question: "What conditions or situations at this university enhance or deter the research process for you?" New questions were added, depending on the flow of the conversation, with some comments from both the interviewer and interviewees.

The interviews were digitally recorded and transcribed. Some field notes were made during and after each interview. In addition, some other sources of data, such as via the Internet and hard copies of records, were examined to verify information shared during the interviews and to amplify the validity of the findings.

Instrument

The quantitative survey used for this investigation was heavily based on both the "Faculty at Work" questionnaire (Appendix A) designed by Blackburn et al.

(1991) and a version of the questionnaire modified by Hughes (1996). The original "Faculty at Work" survey targeted several areas, such as teaching, service, and scholarship, which were not relevant to the present study, which focuses only on faculty publishing productivity. Questions for the "Faculty at Work" survey were developed from a stratified random sample of 100 interviews with university professors. These interviews were the bases for the questionnaire questions. The survey was submitted to a reliability retest, with subsets of identical questions sent to a random sample of original respondents a second time after 6 weeks. Items with low reliability were deleted. The final survey "Faculty at Work" had high levels of reliability (Blackburn & Mackie, 1992). The version modified by Hughes (1996) also had high levels of reliability and stability through a retest process.

The Hughes modified version allowed the focus to be narrowed to faculty research productivity and improved on the first survey by including social contingencies as a set of predictors, among other modifications. Similarly, this current research expanded Hughes's survey by including a new set of variables to examine Environmental conditions as a predictor of faculty research productivity. This predictor was built with a set of some external data

collected from universities, such as endowment size, grants obtained, research expenses, type of institution, and university setting to develop an index. Along with the index, a short set of questions regarding faculty perception of environmental condition was used.

The original "Faculty at Work" study considered Environmental conditions to be part of the conceptual framework, but did not include them in the survey due to length constraints.

The online questionnaire distributed to faculty members had three sections and employed Likert-type questions. The first section (Work Environment) focused on their perceptions of their work environment, including queries regarding institutional, time allocation, Environmental response, and the Environmental conditions surrounding the faculty member. In the second section (Personal Characteristics), participants were asked to examine their perceptions of personal characteristics, scholarly behaviors, and conditions that would promote or prevent research productivity among scholars. The third section (Background) was linked to several faculty background characteristics, such as gender, age, ethnicity, training, career-achieved experience, and research records. This section assessed the dependent variable by inquiring

about articles published and books or chapters coauthored or edited within the last 2 years. The study variables and corresponding items, designed according to the theoretical framework, are summarized in Table 2.

Table 2

Variables and Corresponding Questionnaire Items

Variables	Questionnaire Items
A. Environmental Conditions	8 a-g
B. Environmental Response	9 a-h
C. Social Knowledge	
1. Institutional environment	2 a-k
2. Immediate administrator	3 a-e
3. Next level administrator	4 a-e
4. Professor influence	10 a-h
D. Self Knowledge	
1. Self-know. Others	11 a-t
2. Self-know. Me	12 a-t
E. Social Contingencies	13 a-g
F. Scholarly Behaviors	14 a-j
G. Background Variables	
1. Socio-demographic background	21, 23, 24
2. Short-term career background	15-18, 22, 25-33
3. Entire career background	19, 20, 38-41
H. Dependent Variables	
1. Articles published	34
2. Books, conference proceedings, and books edited	35-37

The quantitative questionnaire, before administrating, was submitted to three professor-judges with higher education expertise to determine its validity. They were told to review the questionnaire and see if the questions were developed according to the purpose of the study. A few corrections were made. A correlation analysis was used in order to verify the Cronbach Alpha Coefficient for the instrument. The resulting reliability coefficient was 0.88.

To gather qualitative data about some of these quantitative survey findings, the last question (42) of the survey asked for emails of professors willing to do some follow-up e-inquiries.

Data Analysis Procedures

The main statistical tool used was regression. Some of the demographic and career variables such as gender and administrative position were analyzed with multivariate analysis of variance (MANOVA).

The independent variables for this investigation were socio-demographic, career-achieved experience, self-knowledge, social knowledge, environmental conditions, environmental responses, social contingencies, and behavior. The dependent variable, research output, was the number of scholarly articles, books authored or coauthored,

conference proceedings, and books edited and published within the last 2 years.

The qualitative data collected through follow-up questions were analyzed to establish deeper findings. After evaluating the data collected from follow-up questions, the responses were grouped in common themes and collective experiences that may explain how faculty research is taking place within the selected sample of universities.

Finally, a similar procedure was undertaken to process the personal interviews using coding for emergent themes arising from the records. Code names replaced actual participant names, in order to protect the privacy of the interviewees.

Summary

This chapter has presented a description of the main procedures used to select the population and sample, the collection of the data, the type of instruments used, and the analyses carried out to evaluate research questions within a study model.

The following chapter explores the results in their different levels according to the findings of this investigation.

CHAPTER FOUR

QUANTITATIVE RESULTS

The purpose of this study was to determine to what extent organizational environment and personal characteristics of faculty members relate on research productivity at selected not-for-profit, private, doctorate-granting universities.

This chapter reviews findings from the quantitative survey including a summary of demographic variables as well as statistical analysis of regressions.

Data Source

As mentioned in chapter 3, a web-based questionnaire was used to collect data from 12 universities classified as small- to medium-sized, not-for-profit, private, doctorate-granting universities (Carnegie Foundation, 2007).

A total of 277 faculty members participated in this survey, the basis of the quantitative analysis (Appendix A). This section examines only the quantitative data. Table 3 summarizes some characteristics of the sample.

Table 3

Sample Characteristics

Variables	Frequency	Percentage
Age		
Less than 40	49	17.7
Between 41-50	75	27.1
More than 50	153	55.2
Total	277	100.0
Gender		
Female	112	40.4
Male	165	59.6
Total	277	100.0
Ethnicity		
Amer. Indian/Alaskan Native	3	1.1
Asian/Pacific Islander	6	2.2
Black/Non-Hispanic origin	5	1.8
Hispanic	15	5.4
White/Non-Hispanic origin	248	89.5
Total	277	100.0
Type of University		
PD	253	91.3
Stem	24	8.7
Total	277	100.0
Kind of Unit/Department		
Humanistic/Fine Arts	81	29.2
Sciences/Applied Sciences	76	27.4
Social Sciences	120	43.3
Total	277	100.0
Academic Rank		
Other/Adjunct	24	8.7
Asst. Professor	71	25.6
Assoc. Professor	87	31.4
Professor	95	34.3
Total	277	100.0
Teaching Level		
Undergraduate Level	107	38.6
Graduate Level	90	32.5
Both Levels	80	28.9
Total	277	100.0

The majority of faculty members for this sample were more than 50 years old (55.2%), males (59.6%), White (89.5%), from professional-oriented universities (91.3%), in social sciences (43.3%), professors (34.3%), and teaching at undergraduate level (38.6%).

Regarding faculty research productivity as measured by the four dependent variables (Articles, Books authored or coauthored, Chapters in books and conference proceedings, Books edited), Table 4 shows sample sizes, means, and standard deviations of the overall sample.

Table 4

Characteristics of Productivity in the Last 2 Years

Dependent Variables	*N*	Mean	Std. Deviation
Articles	277	1.85	2.500
Books authored or co-authored	277	.23	.562
Chapters in books and conference proceedings	277	.96	1.720
Books edited	277	.26	.737
Total	277		

Productivity in the form of articles was highest at 1.85 followed by chapters in books and conference proceedings at 0.96. Books and books edited were very low at only 0.23 and 0.26 respectively. In all cases the

standard deviations were quite large, indicating high disparities among faculty productivity.

Demographic Statistics

This section examines the relationship between productivity and certain demographic characteristics.

Multivariate analysis of variance (MANOVA) was used to examine the relationship between demographic and career characteristics and productivity. Follow-up univariate analyses were conducted for statistically significant multivariate *F* statistics. For these analyses, the Bonferroni method for controlling Type I error was applied (Vogt, 2005). Thus, the level of significance for all follow-up analyses was set at 0.05/4 = 0.01. Discriminant analysis was also used to determine what measures of productivity differentiated groups among the selected demographic characteristics.

Socio-Demographic Background

Three questions measured socio-demographic characteristics of the sample. They were age (q21), gender (q23), and ethnicity (q24). The following sections show relationships between these variables and productivity.

Age

Table 5 represents the different levels of productivity of professors at different age (below 40, between 41 and 50, and above 51).

Table 5

Age and Dependent Variables

Age	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
< 40	*N*	49	49	49	49
	Mean	1.84	.20	1.00	.06
	SD	1.940	.499	1.399	.242
41-50	*N*	75	75	75	75
	Mean	2.48	.21	.76	.29
	SD	2.984	.527	1.149	.818
51 +	*N*	153	153	153	153
	Mean	1.55	.25	1.05	.31
	SD	2.353	.599	2.021	.790
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

As the table indicates, productivity varies across age. For instance, in the case of articles published (q34), the highest mean (2.48) was for those between 41 and 50 years, decreasing among faculty older than 50 years. The standard deviations were quite large for most of the means. This denotes a high variation between professors in research productivity.

To determine if there were differences among the three age groups in productivity, Multivariate Analysis of Variance was used. With Wilks's Lambda = 0.944, $F_{(8)}$ = 1.985, and p = 0.046, statistically significant differences among the three age groups were found for this linear combination of measures of productivity. Follow-up one-way analysis of variance using α = 0.01 did not result in group differences for any single measure of productivity (see Table 6).

Table 6

Univariate Analysis for Age and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Age					
	F	3.556	.165	.709	2.286
	Sig	.030	.848	.493	.104
	Eta	.025	.001	.005	.016

To better understand the nature of the relationship between age groups and productivity, a Discriminant analysis was done to see where these differences were. Table 7 shows that only the first discriminant function was statistically significant (p = 0.04).

Table 7

Discriminant Functions for Set of Variables

Test of Function(s)	Wilks's Lambda	Chi Square	*df*	Sig.
1 through 2	.944	15.738	8	.046
2	.983	4.633	3	.201

The group centroids are presented in Table 8 whereas the structure matrix is presented in Table 9.

Table 8

Functions at Group Centroids

Age	Function 1
Below 40	.020
Between 41-50	.315 *
More than 50	-.161

* Significant at $p = 0.05$.

Table 9

Structure Matrix for Set of Variables

	Function 1
Q34 articles	.788 *
Q36 chapters in books or conference proceedings	-.346 *
Q37 books edited	-.087
Q35 books authored or co-authored	-.135

* Significant at $p = 0.05$.

The results in these two tables suggest that faculty between the ages of 41 and 50 appear to have higher mean number of articles published compared to those above 50 or those below 40. These later groups appear to have a higher mean number of chapters in books or conference proceedings.

Gender

Table 10 shows mean productivity by gender. For both males and females, productivity is higher for articles published and conference proceeding presented. It also appears that productivity among males is higher than for females.

Table 10

Gender and Dependent Variables

Gender	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Female	*N*	112	112	112	112
	Mean	1.44	.16	.78	.20
	SD	2.052	.436	1.541	.517
Male	*N*	165	165	165	165
	Mean	2.13	.28	1.08	.31
	SD	2.733	.630	1.826	.853
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

In spite of these apparent gender differences, it was not statistically significant (Wilks's Lambda = 0.971, $F_{(4)}$ = 2.051, and p = 0.088).

Ethnicity

Caucasian faculty members comprised 89.5% of the respondents. The remaining 10.5% were of other ethnic groups comprising Asian/Pacific Islanders, Hispanics, and others (see Table 3).

The Multivariate Analysis of Variance was not statistically significant (Wilks's Lambda = 0.976, $F_{(4)}$ = 1.694, and p = 0.152). Because of low sample size for most minority groups it was not possible to make any comparison between groups' means crossed with the dependent variables. This distribution of professors was overwhelmingly Caucasian, showing a mismatch with the actual racial profile of the American population.

Career Background

The online survey collected data about career background through the last section of the questionnaire.

Kind of Unit or Department

Question 15 asked faculty to identify themselves in three broad areas of specialization: Humanities/Fine Arts,

Sciences/Applied Sciences, and Social Sciences. Table 11 shows the mean productivity by area/unit.

Faculty from sciences and applied sciences had the highest mean number of articles published (M = 2.58) whereas faculty from humanities had the highest mean number of books authored or coauthored (M = 0.28). Social sciences professors had the highest mean number of book chapters and conference proceedings (M = 1.03) and books edited (M = 0.33).

Table 11

Kind of Unit and Dependent Variables

Kind of Unit	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Humani-ties	*N*	81	81	81	81
	Mean	1.30	.28	.99	.21
	SD	1.785	.656	1.743	.564
Applied	*N*	76	76	76	76
Sciences	Mean	2.58	.18	.82	.22
	SD	3.336	.509	1.671	.645
Social	*N*	120	120	120	120
Sciences	Mean	1.77	.23	1.03	.33
	SD	2.188	.526	1.744	.881
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

To determine if there were differences among the three kinds of unit groups in productivity, Multivariate Analysis

of Variance was used. With Wilks's Lambda = 0.938 and $F_{(8)}$ = 2.207 and p = 0.026, statistically significant differences among the 3 kinds of unit groups were found for this linear combination of measures of productivity. Follow-up one-way analysis of variance using α = 0.01 resulted in group differences only for article productivity (see Table 12).

Table 12

Univariate Analysis for Kind of Unit and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Unit					
	F	5.455	.628	.385	.742
	Sig	.005	.535	.681	.477
	Eta	.038	.005	.003	.005

A Post Hoc multiple comparison procedure using Student-Newman Keuls (SNK) was used to determine specific group differences (see Table 13). This table shows that professors from sciences and applied sciences units/departments had significantly higher mean number of articles published (M = 2.58) than from humanistic and social sciences.

Table 13

Post Hoc Test for Kind of Unit and Article Productivity

Question 15: In what kind of unit is your principal appointment?	*N*	Subset for alpha = .05	
		1	2
Humanistic/Fine Arts	81	1.300	
Social Sciences	120	1.770	
Sciences/Applied Sciences	76		2.580
Sig.		.204	1.000

Specialization

Question 16 asked the area of specialization of each faculty. Table 14 shows that faculty from the physics and math disciplines had the highest mean number for articles (*M* = 4.15). The second highest mean number were professors from the engineering and computer group (*M* = 3.00). The lowest mean number for articles was among art faculty (*M* = 1.22).

Faculty from history, politics, and law were the most productive with regard to books (*M* = 0.68) and books edited (*M* = 0.57). Engineering (*M* = 1.53) and business (*M* = 1.59) faculty members had the highest mean numbers in conference proceedings in the last 2 years.

Table 14

Areas of Specialization and Dependent Variables

Specialization	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Education	*N*	36	36	36	36
	Mean	1.42	.22	.97	.19
	SD	2.020	.485	1.665	.749
Engineer	*N*	17	17	17	17
Computer	Mean	3.00	.24	1.53	.47
	SD	3.102	.562	2.718	1.068
Bio-	*N*	19	19	19	19
chemistry	Mean	2.00	.05	.79	.21
	SD	2.285	.229	1.316	.535
Theology	*N*	25	25	25	25
	Mean	1.52	.28	.76	.24
	SD	1.531	.542	1.091	.597
Psychology	*N*	32	32	32	32
	Mean	1.72	.25	1.16	.09
	SD	2.466	.568	2.216	.390
Language	*N*	17	17	17	17
	Mean	1.24	.06	.94	.35
	SD	2.016	.243	1.560	.606
Business	*N*	17	17	17	17
	Mean	1.88	.18	1.59	.00
	SD	2.088	.529	2.293	.000
Health	*N*	17	17	17	17
Sciences	Mean	1.76	.35	.59	.41
	SD	4.191	.702	.939	.712
Physics	*N*	13	13	13	13
Math	Mean	4.15	.00	.15	.23
	SD	4.543	.000	.376	.832
History-	*N*	28	28	28	28
Law	Mean	2.32	.68	1.18	.57
	SD	2.405	.983	1.722	1.168
Art	*N*	9	9	9	9
	Mean	1.22	.00	.22	.11
	SD	2.224	.000	.667	.333
Adm. and	*N*	47	47	47	47
leadership	Mean	1.43	.15	.94	.26
	SD	1.500	.416	1.712	.765
Total	*N*	277	277	277	.277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

To determine if there were differences among the specialization groups in productivity, Multivariate Analysis of Variance was used. With Wilks's Lambda = 0.769 and $F_{(44)} = 1.620$ and $p = 0.007$, statistically significant differences among the 12 specialization groups were found for this linear combination of measures of productivity. Follow-up one-way analysis of variance using $\alpha = 0.01$ resulted in group differences only for books authored and coauthored (see Table 15).

Table 15

Univariate Analysis for Specialization and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Spec					
	F	1.911	2.631	.985	1.086
	Sig	.038	.003	.460	.372
	Eta	.073	.098	.039	.043

A Post Hoc Test SNK was performed to see specific group differences. Table 16 shows that faculty members from humanistic disciplines, such as history, politics, and law groups, were significantly different from the physics-math, art, biology and chemistry, and language, having the

highest mean number of book authored and coauthored (M = 0.68).

Table 16

Post Hoc Test for Specialization and Books Authored and Coauthored

Question 16: What is your area of specialization?	*N*	Subset for alpha = .05	
		1	2
Physics-Math	13	.000	
Art	9	.000	
Bio-chemistry	19	.050	
Language	17	.060	
Administration-leadership	47	.150	.150
Business	17	.180	.180
Education	36	.220	.220
Engineer-computer	17	.240	.240
Psychology	32	.250	.250
Theology	25	.280	.280
Natural-Health Science	17	.350	.350
History-Politics-Law	28		.680
Sig.		.652	.059

Years at This University

Faculty working at any specific university for the first 15 years had an increasing upward productivity across all the dependent variables (see Table 17). Articles and conference proceedings had the highest mean number productivity between 6 and 15 years; after that they tended to decrease. On the other side, books and books edited

experienced an upward growth among professors with the longest stay.

Table 17

Years at This University and Dependent Variables

Years at	Measure	Articles	Books authored or co-authored	Conference proceedings	Books Edited
< 5	*N*	84	84	84	84
	Mean	1.74	.20	.85	.11
	SD	2.282	.485	1.639	.381
6 - 15	*N*	118	118	118	118
	Mean	2.19	.18	1.06	.31
	SD	2.647	.465	1.613	.824
16 +	*N*	75	75	75	75
	Mean	1.45	.35	.93	.36
	SD	2.457	.744	1.968	.864
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

To find out if there were group differences among faculty productivity and the years spent at a given university, Multivariate Analysis of Variance was used. With Wilks's Lambda = 0.944 and $F_{(8)} = 1.985$ and $p = 0.04$, statistically significant differences among the three groups was found for this linear combination of measures of productivity. Follow-up one-way analysis of variance using $\alpha = 0.01$ did not result in group differences (see Table 18).

Table 18

Univariate Analysis for Years at This University and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Years at	*F*	2.114	2.242	.391	2.846
	Sig	.123	.108	.677	.060
	Eta	.015	.016	.003	.020

To better understand the nature of the relationship between years-at-this-university groups and productivity, a Discriminant analysis was done to see where these differences were. Table 19 shows that only the first discriminant function was statistically significant (p = 0.04).

Table 19

Discriminant Functions for Set of Variables

Test of Function(s)	Wilks's Lambda	Chi Square	*df*	Sig.
1 through 2	.944	15.742	8	.046
2	.980	5.614	3	.132

The group centroids are presented in Table 20 whereas the structure matrix is shown in Table 21. According to these two tables, the most productive group for books was more than 16 years at this university. Faculty members between 6 and 15 years were more productive in article outputs.

Table 20

Functions at Group Centroids

Years at This University	Function 1
Less than 5	-.035
Between 6-15	-.168
More than 16	.304

Table 21

Structure Matrix for Set of Variables

	Function 1
Q35 books authored or co-authored	.650 *
Q34 articles	-.596 *
Q37 books edited	.220
Q36 chapters in books or conference proceedings	-.125

* Significant at $p = 0.05$.

Type of Appointment

Table 22 illustrates professors with tenure as actually the most productive across all the dependent

variables. Yearly appointed faculty (adjuncts) had the lowest mean number (M = 0.72) for article outputs. Faculty members without tenure were lower in books, chapters, and conference proceedings than tenured professors.

Table 22

Type of Appointment and Dependent Variables

Appointment	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Visit	*N*	9	9	9	9
	Mean	1.56	.22	.56	.22
	SD	2.744	.441	1.130	.667
Yearly	*N*	29	29	29	29
	Mean	.72	.07	1.07	.31
	SD	1.645	.258	2.463	.806
No tenure	*N*	113	113	113	113
	Mean	1.65	.15	.79	.17
	SD	2.375	.448	1.612	.480
Tenured	*N*	126	126	126	126
	Mean	2.31	.34	1.12	.34
	SD	2.667	.683	1.642	.896
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

To determine if there were differences among the four kinds of appointment groups in productivity, Multivariate Analysis of Variance was used. With Wilks's Lambda = 0.922 and $F_{(12)}$ = 1.866 and p = 0.035, statistically significant differences among the four kinds of appointment groups were found for this linear combination of measures of

productivity. Follow-up one-way analysis using $\alpha = 0.01$ did not result in group differences (see Table 23).

Table 23

Univariate Analysis for Kind of Appointment and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Unit					
	F	3.760	3.273	.942	1.150
	Sig	.011	.022	.421	.329
	Eta	.040	.035	.010	.012

To better understand the nature of the relationship between kind of appointment groups and productivity, a Discriminant analysis was done to see where these differences were. Table 24 shows only the first function as statistically significant ($p = 0.03$).

Table 24

Discriminant Functions

Test of Function(s)	Wilks's Lambda	Chi Square	*df*	Sig.
1 through 2	.922	22.207	12	.035
2 through 3	.982	4.920	6	.554
3	.999	.348	2	.840

According to group Centroids and the structure matrix presented in Tables 25 and 26, the most productive group for articles and books authored or coauthored was faculty members with tenure. Also the least productive in articles and books were the yearly term-appointed professors.

Table 25

Group of Centroids

Kind of Appointment	Function 1
Visiting	-.087
Yearly term appointment	-.494
Regular without tenure	-.151
Regular with tenure	.255

Table 26

Structure Matrix for Set of Variables

	Function 1
Q34 articles	.781 *
Q35 books authored or co-authored	.728 *
Q37 books edited	.265
Q36 chapters in books or conference proceedings	.221

* Significant at $p = 0.05$.

Administrative Position

As shown in Table 27, faculty members with no administrative responsibility had a slightly higher mean

number (M = 0.28) in edited books than the ones who dealt with administration (M = 0.22).

Table 27

Administrative Position and Dependent Variables

Adm Assign	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Yes	*N*	87	87	87	87
	Mean	2.01	.24	.97	.22
	SD	2.879	.609	1.624	.579
No	*N*	190	190	190	190
	Mean	1.78	.23	.96	.28
	SD	2.310	.541	1.766	.799
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

Faculty involved in administration scored higher (M = 2.01) in publication of articles than those who did not have any administrative position (M = 1.78). The Multivariate Analysis of Variance was not statistically significant for this linear combination of measures of productivity (Wilks's Lambda = 0.996, $F_{(4)}$ = 0.292, and p = 0.883).

Academic Rank

There were four categories for faculty members in this question: assistant, associate, professor, and other or

adjunct. As Table 28 shows, there was increasing research productivity across all the dependent variables. Adjuncts or other kind of faculty had the lowest levels of productivity among faculty.

Table 28

Academic Rank and Dependent Variables

Acad Rank	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Other	*N*	24	24	24	24
	Mean	.88	.04	.29	.21
	SD	2.252	.204	.751	.721
Assist	*N*	71	71	71	71
	Mean	1.32	.20	.85	.20
	SD	1.730	.467	1.400	.551
Assoc	*N*	87	87	87	87
	Mean	1.82	.15	1.00	.22
	SD	1.962	.418	1.614	.706
Prof	*N*	95	95	95	95
	Mean	2.53	.38	1.18	.37
	SD	3.232	.746	2.129	.876
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

To verify if there were differences among the four academic rank groups in productivity, Multivariate Analysis of Variance was used. With Wilks's Lambda = 0.911, $F_{(12)}$ = 2.146 and p = 0.013, statistically significant differences among the four rank groups were found for this linear combination of measures of productivity. Follow-up one-way

analysis of variance using $\alpha = 0.01$ resulted in group differences for articles and books authored and coauthored (see Table 29).

Table 29

Univariate Analysis for Academic Rank and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Acad. Rank	*F*	4.776	3.918	1.859	.988
	Sig	.003	.009	.137	.399
	Eta	.050	.041	.020	.011

A Post Hoc multiple comparisons using SNK was done to see specific group differences. Table 30 shows that the group professor had significantly higher mean number of articles published ($M = 2.53$) than other ($M = 0.88$) and assistant ($M = 1.32$). But full professors were not significantly different from associate professors.

Table 31 illustrates that the group professor had significantly higher mean number of books authored ($M = 0.38$) than the group other/adjunct ($M = 0.04$).

Table 30

Post Hoc Test for Academic Rank and Articles Productivity

Question 27: Your current academic rank	*N*	Subset for alpha = .05	
		1	2
Other/adjunct	24	.880	
Asst. Professor	71	1.320	
Assoc. Professor	87	1.820	1.820
Professor	95		2.530
Sig.		.127	.143

Table 31

Post Hoc Test for Academic Rank and Books Authored and Coauthored

Question 27: Your current academic rank	*N*	Subset for alpha = .05	
		1	2
Other/adjunct	24	.040	
Assoc. Professor	87	.150	.150
Asst. Professor	71	.200	.200
Professor	95		.380
Sig.		.329	.091

Teaching Level

Table 32 presents faculty members involved in both undergraduate and graduate teaching with the highest mean in article productivity (M = 2.65). Professors teaching graduates students had the highest means numbers in books, conference proceedings, and books edited.

Table 32

Teaching Level and Dependent Variables

Teach Level	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Under graduate	*N*	107	107	107	107
	Mean	1.17	.26	.65	.26
	SD	1.674	.572	1.461	.634
Graduate	*N*	90	90	90	90
	Mean	1.96	.28	1.47	.31
	SD	2.071	.671	2.230	.920
Both	*N*	80	80	80	80
	Mean	2.65	.14	.80	.21
	SD	3.457	.381	1.195	.630
Total	*N*	277	277	277	277
	Mean	1.85	.23	.96	.26
	SD	2.500	.562	1.720	.737

To find out if there were differences among the three teaching-level groups in productivity, a Multivariate Analysis of Variance was conducted. With Wilks's Lambda = 0.882, $F_{(8)} = 4.380$ and $p = 0.000$, statistically significant differences among the three teaching-level groups were found for this linear combination of measures of productivity. Follow-up one-way analysis of variance using $\alpha = 0.01$ resulted in group differences for articles and conference proceedings productivity (see Table 33).

Table 33

Univariate Analysis for Teaching Levels and Dependent Variables

Var.	Measure	Articles	Books authored or co-authored	Conference proceedings	Books edited
Teach Levels	*F*	8.605	1.584	6.164	.378
	Sig	.000	.207	.002	.685
	Eta	.059	.011	.043	.003

A Post Hoc multiple comparisons using SNK was performed to determine specific group differences. Table 34 shows that professors from both levels of teaching groups had a significantly higher mean number of article productivity (M = 2.65) than the undergraduate-level group (M = 1.17).

Table 34

Post Hoc Test for Teaching Levels and Articles Productivity

Question 28: You are teaching at:	*N*	Subset for alpha = .05	
		1	2
Undergraduate Level	107	1.17	
Graduate Level	90		1.96
Both Levels	80		2.65
Sig.		1.000	.055

Table 35 presents professors from both levels of teaching group as having a significantly higher mean number of conference proceedings outputs (M = 1.47) than undergraduate (M = 0.65) and graduate teaching (M = 0.80) groups.

Table 35

Post Hoc Test for Teaching Levels and Conference Proceeding Productivity

Question 28: You are teaching at:	*N*	Subset for alpha = .05	
		1	2
Undergraduate Level	107	.650	
Graduate Level	80	.800	
Both Levels	90		1.470
Sig.		.561	1.000

Factor Analysis

Following the conceptual grouping of questions, 12 factor analyses were conducted, yielding in total 21 factors. Varimax rotation was selected to maximize the variances of the new factors or variables (Vogt, 2005). The principal component analysis was set up at a minimum of 1 Eigenvalue to accept a factor. A factor loading of .50 was used as the cut-off for items to belong to a factor (Vogt, 2005). Table 36 shows factors and their loadings.

Table 36

New Factors and Their Loadings

Factors	KMO/ Variance	Loads
Environmental Conditions	.76/69%	
1. Teaching Equipment		
Q.8c. Basic computer equipment provided for use in my office or at home		.642
Q.8d. Internet connection quality and speed		.736
Q.8e. Classroom equipment		.803
Q.8f. Classroom space		.787
2. Univ. Teaching Equipment		
Q.8a. Instruments and equipment for basic research		.892
Q.8b. Space and supplies for laboratory research		.873
Environmental Response	.87/52%	
3. Environmental Response		
Q.9a. Award a larger than average merit raise		.674
Q.9b. Promote the individual assuming s/he is less than a full professor		.649
Q.9c. Assign the person an additional researchassistant		.741
Q.9d. Provide more clerical support		.704
Q.9e. Reduce the person's teaching load		.740
Q.9f. Provide some extra dollars for a conference attendance		.813
Q.9g. Award the person additional equipment		.841
Q.9h. Arrange a public seminar for the presentation of recent research		.601
Social Knowledge-1	.58/73%	
4. Environmental Trust		
Q.2d. I am encouraged by my institution to work for the collective good of my unit.		.618
Q.2e. Faculty can trust the administration to actin good faith for the betterment of the institution.		.871
Q.2f. Faculty can trust established faculty groups (e.g. governance committees) to act in good faith for the betterment of the institution.		.785
Q.2k. The collegial resources available atmy institution help enrich my research.		.874
5. Teaching Commitment		
Q.2g. The faculty in my unit are more committed to the teaching of their discipline than they are to adding to their discipline's knowledge base.		.907
Q2h. The faculty in this institution are more committed to teaching than to research in their disciplinary domain.		.903

Table 36-*Continued.*

Factors	KMO/ Variance	Loads
Social Knowledge-2	.86/70%	
6. Immediate Administrator		
Q.3a. Administrative Skills		.866
Q.3b. Research Skills		.605
Q.3c. Professionalism		.905
Q.3d. Experience		.803
Q.3e. Personality		.839
7. Next Level Administrator		
Q.4a. Administrative Skills		.863
Q.4b. Research Skills		.712
Q.4c. Professionalism		.865
Q.4d. Experience		.820
Q.4e. Personality		.855
Social Knowledge-3	.78/53%	
8. Professor Influence		
Q.10c. Selection of the next chair of your unit		.768
Q.10d. Obtaining money for travel to professional association meetings		.627
Q.10f. Selection of the next faculty member hired in your unit		.781
Q.10g. Securing resources to maintain ongoing academic programs that you consider important		.720
Q.10h. Establishing criteria for annual review of faculty members		.733
Self-Knowledge-1	.79/67%	
9. Faculty Traits (Others)		
Q.11f. Communicates well		.701
Q.11g. Is organized		.572
Q.11j. Holds high standards		.698
Q.11k. Has integrity		.806
Q.11l. Respects others		.813
Q.11o. Is supportive		.800
Q.11r. Is understanding		.828
Q.11s. Is perseverant		.661
10. Research Commitment (Others)		
Q.11c. Publishes		.907
Q.11i. Is highly committed to research		.879
11. Work values (Others)		
Q.11p. Is competitive		.872
Q.11q. Is ambitious		.834

Table 36-*Continued.*

Factors	KMO/ Variance	Loads
Self-Knowledge-2	.75/63%	
12. Faculty Traits (Me)		
Q.12f. Communicates well		.636
Q.12l. Respects others		.584
Q.12o. Is supportive		.707
Q.12r. Is understanding		.755
Q.12t. Has a sense of humor		.712
13. Person Standards		
Q.12h. Believes in the value of hard work		.696
Q.12j. Holds high standards		.705
Q.12k. Has integrity		.770
Q.12s. Is perseverant		.589
14. Research Commitment (Me)		
Q.12c. Publishes		.868
Q.12i. Is highly committed to research		.861
15. Work Values (Others)		
Q.12p. Is competitive		.846
Q.12q. Is ambitious		.851
Social Contingencies	.70/50%	
16. Social Contingencies		
Q.13b. Child care		.672
Q.13c. Financial crises		.681
Q.13e. Relationship strain with spouse or other		.712
Q.13f. Unusually heavy domestic/family responsibilities		.751
Scholarly Behaviors-1	.83/56%	
17. Research Interest		
Q.14a. Submitted a scholarly article for publication		.531
Q.14b. Used e-mail to discuss your research with colleagues		.744
Q.14c. Presented your ongoing work on campus or at a professional meeting		.771
Q.14g. Had informal conversations about research with colleagues at professional meetings		.757
Q.14h. Had telephone conversations with colleagues to discuss your scholarly activities		.694
Q.14i. Submitted a proposal for a conference presentation		.646
18. Grant Research		

Table 36-*Continued.*

Factors	KMO/ Variance	Loads
Q.14d. Submitted a research proposal to a governmental or private agency		.806
Q.14e. Written a research report for a granting agency, institution or other group		.823
Q.14f. Reviewed articles for a professional journal		.545
Q.14j. Submitted a proposal for a scholarly monograph to a publisher		.669
Scholarly Behaviors-2	.70/64%	
19. Research Involved		
Q.32. On how many journal editorial boards have you served in the last two years?		.704
Q.33. For how many journals have you reviewed articles in the last two years?		.763
Q.38. Over your career, about how many refereed articles have you published in academic or professional journals?		.799
Q.Recq41. Over your career, how many chapters in books or conference proceedings have you published?		.691
20. Dissertation Involvement		
Q.Recq30. How many thesis or dissertation committees have you chaired in the last two years?		.870
Q.Recq31. How many thesis or dissertation committees have you served on in the last two years?		.884

Along with FA, the Alpha reliability coefficient was employed to test internal reliability for each new group of items that represented a new variable. A minimum Alpha of .70 or close to it was selected as the acceptable level for a new grouping of questions. The procedures are explained briefly in Table 37.

Table 37

New Variables and Their Reliability

New Variables	Coding name	Items	Alpha
A. Environmental Conditions			
1. Teaching equipment	Uniteacheq	8c-f	.78
2. Research equipment	Resequip	8a,b	.86
3. University conditions	Index	Variables combined	N/A
B. Environmental Response Var.	Envrespo	9a-h	.86
C. Social Knowledge Variables			
1. Environmental Trust	Envtrust	2d,e,f	.77
2. Trust colleague's specialty	Trustcolsp	2j,k	.68
3. Teaching commitment	Teachcomm	2g,h	.78
4. Immediate administrator	Immedadm	3a-e	.88
5. Next level administrator	Nextladm	4a-e	.89
6. Professor influence	Profinfl	10c,d,f,g,h	.78
D. Self-Knowledge Variables			
3. Self-know. Others			
a. Faculty traits	Traitother	11f,g,j,k,l, o,r,s	.88
b. Research commit.	Rescommit	11c,i	.83
c. Work values	Wkvalother	11p,q	.77
4. Self-know. Me			
a. Faculty traits	Traitsme	12f,l,o,r,t	.73
b. Person standards	Personstd	12h,j,k,s	.71
c. Research commit.	Rescomme	12c,i	.74
d. Work values	Wkvalume	12p,q	.79
E. Social Contingencies Variables	Famprobl	13b,c,e,f	.67
F. Scholarly Behaviors Variables			
1. Research interest	Resinter	14a-c,g,h,i	.83
2. Grant research	Grantres	14d,e,f,j	.72
3. Research involved	Resinvol	Q32,33,38, recq41	.71
4. Diss involvement	Dissinvol	Recq30, recq31	.73

The following section explains each new variable that was developed from the result of the factor analysis. They are reviewed in order as they appear in Table 37.

Two sources of data were developed for environmental conditions. The first one was an index with data collected from the universities involved in this research. The selection of these factors was based on a literature review. The highest mean possible for each factor was 2 and the lowest was 1 with two decimals. The index was developed summing all the variables' means to have a combined value ranging between 1 and 2. Table 38 shows the value given to each of the factors that made the index.

Table 38

Environmental Conditions as Index

Index Value	Univ. Type	Pro-fessors	Univ. Location	Univ. Endowment	Library Size	Annual Research
1	PD/	-300	Suburban	-100M	-300K	-1M
2	STEM	300+	Urban	100M+	300K+	1M+

Science-, technology-, engineering-, and mathematics-oriented (STEM) universities have been shown to be more productive than professional-oriented (PD) universities (Gander, 1999). The more faculty a university has, the more

interactions and hence the more research productivity it has as well (Dundar & Lewis, 1998; Kolpin & Singell, 1996; Meador et al., 1992). Taking in consideration the total amount of professors the sampled universities had, faculty members were divided into two categories: below 300 and above 300, to classify them as 1 and 2 respectively. Universities located in urban environments are expected to produce more than suburban ones (Audretsch & Stephan, 1996; Powers, 2003; Zucker et al., 1998). The size of endowment is seen as a promoter for research investments (Lee & Rhoads, 2004). For the endowment size, a point below or above 100 million was selected. The libraries' sizes represented in the sample were identified as below or above 300,000 books. Library size is associated with more resources to do research. Therefore, the bigger the library, the more possibilities faculty members have to accomplish research (Meador et al., 1992). Finally, the amount of money spent in research is also linked to productivity (Powers, 2003). For this factor, a figure of less or more than $1 million spent annually in research endeavors was chosen.

The second source of data was a set of questions (q8a-g) from the survey that, after FA, was divided into two factors. Research equipment (Resequip) measured opinions

about equipment for research. The other factor, teaching equipment (univteacheq), assessed the quality of the teaching resources available at each university.

Environmental response (Envrespo) was intended to assess reactions, such as rewards, free time, research assistance, and the like that a unit or university gave to a professor's research productivity.

For the Social-Knowledge set of variables, environmental trust (Envtrust) assessed the faith that faculty had in administration, colleagues, and their working environment as a positive source of motivation. Trust colleague's specialty (Trustcolsp) meant the support a professor can have in his or her area of specialty. Teaching commitment (Teachcommit) was related to teaching emphasis, whether at departmental or university level. Satisfaction with administrators was divided in two. The first one evaluated immediate administrators (Immedadm). These administrators were in a closer relationship with professors. The next level of administrators (Nextladm) consisted of deans, associate vice presidents, and the like. Professor influence (Profinfl) determined perceptions about the degree of influence a professor had on resources, administration, and personnel.

Self-knowledge variables were divided into two sets of questions: faculty self-perceptions about others and faculty self-perceptions about themselves. The first set, "self-knowledge-other," had assessed three factors: (a) how faculty members saw other valued colleagues in terms of high standards, integrity, support, and understanding to others (Traitother); (b) research commitment as an important characteristic (rescommit); and (c) work values to push hard and get things done (wkvalother).

The other set, "self-knowledge-me," also evaluated four factors: (a) standards of personality (personstd); (b) faculty traits related to communication and understanding of others (Traitsme); (c) personal research commitment (Rescomme); and (d) work values such as ambitiousness and competitiveness (Wkvalume).

The last construct for environmental variables was social contingencies (Famprobl). It evaluated how family problems can affect research productivity.

Lastly, the scholarly behaviors construct had four factors related to research activities, such as research interest (Resinter), research through different types of grants (Grantres), dissertation involvement as chair or committee member (Dissinvol), and research involvement recently and throughout career (Resinvol).

Sequence of Variables

For the final regression model, the variables were introduced using enter method for the regressions in SPSS. The sequence and blocks were done following the theoretical framework set in chapter 1.

Table 39 shows the blocks of variables grouped and the sequence of entry. More details about results can be seen in Appendix B.

Table 39

Blocks of Variables for Regressions

Variable Name	Entry Order	Conceptual Framework
Resequip	1	
Univteacheq	1	Environmental conditions
Index	1	
Envrespo	2	Environmental response
Trustcolsp	3	
Envtrust	3	
Teachcommit	3	Social knowledge
Immedadm	3	
Nextladm	3	
Profinfl	3	
Traitother	4	
Rescommit	4	
Wkvalother	4	Self-knowledge
Personstd	4	
Traitsme	4	
Rescomme	4	
Wkvalume	4	
Famprobl	5	Social contingencies
Resinter	6	
Grantres	6	
Dissinvol	6	Scholarly behaviors
Resinvol	6	

A total of six block-entries were developed to run regressions for the dependent variables.

Regression Results

Following the succession traced in Table 39, the results of the combination of variables are displayed in Table 40. The relative size and sign of the standardized beta weights signify the amount of positive or negative variation on the dependent variable (q34). The bottom of the table shows the different levels of significance for each loading, explains the percentages of each block of regressions, and tells whether each one of the six blocks was significant. The ANOVA tables were significant (p .001) for all the blocks (see Appendix B).

As was mentioned above, Environmental conditions was divided into three factors. Teaching equipment (Univteacheq) was significant with a negative beta in all the blocks. The better teaching equipment and facilities that a university had, the lower the research productivity seems to be. A possible explanation could be that better reported teaching facilities related to a heavier teaching emphasis provided by a university. Having more and better facilities to teach is showing how the university cares about teaching in opposition to research. The index

measuring Environmental conditions in which professors worked was significant in the first three blocks. Environmental conditions added 7.1% of explanation for the first block.

Table 40

Variations in Research Outputs During the Last 2 Years (q34) Predicted by Variable Sets

Models	1st Block	2nd Block	3rd Block	4th Block	5th Block	6th Block
Environmental Cond.						
Research equipment	.006	-.020	.021	.026	.025	.031
Univ. teaching equip.	-.118*	-.154**	-.140**	-.168***	-.168***	-.093*
Index	.233****	.225****	.141**	.003	.003	-.042
Environmental Response						
Environment resp.		.170***	.147**	.098	.097	.075
Social Knowledge						
Trust colleague's specialty			-.105*	-.086	-.086	-.057
Environmental trust			-.103	-.075	-.074	-.078
Teaching commitment			-.184***	-.076	-.076	-.044
Immediate adm.			-.024	-.028	-.028	.048
Next level adm.			.000	.039	.039	.049
Professor infl.			.070	.011	.011	-.072
Self-Know. Others						
Faculty traits				.042	.042	.039
Research commit.				.127**	.126**	.096*
Work values				-.039	-.038	-.065
Self-know. Me						
Person standards				-.089	-.090	-.035
Faculty traits				-.037	-.037	-.033
Research commit.				.458****	.458****	.211***
Work values				.039	.040	.076
Social Contingencies						
Family problems					-.009	.002
Scholarly Behaviors						
Research interest						.117*
Grant research						.028
Diss involvement						.048
Research involved						.381****
Variance in %	7.1	9.7	15.2	36.9	36.9	50.1

Note. Bold numbers are significant models.
*$p < .10$. **$p < .05$. ***$p < .01$. ****$p < .001$.

Environmental response (Envrespo) had one factor and was only significant in blocks 2 and 3. This factor added 2.6%, totaling 9.7% of explanation for block 2.

Social knowledge had six factors. Only trust colleague's specialty and teaching commitment were significant in the third block. The betas were negative. Professors committed to teach seemed to be less productive, as can be expected. Faculty trusting colleague's specialty appeared to be less research productive. These factors added 5.5%, totaling 15.2% of the explanation.

Self-knowledge variables were divided into two constructs. The first one assessed self-perception about other valued faculty members. The second one estimated self-perception about the faculty themselves. This factor added 21.7% of the variance, totaling 36.9% of the variance. This was the highest set of predictors for all the regressions. Research commitment (Rescommit and Rescomme) was perceived as an important characteristic for valued faculty. It was significant through all the blocks. Professors perceived personal research commitment as a very important factor. So the way faculty members perceived themselves to do research was a key factor in predicting articles published.

Social contingencies block (Famprobl) was not significant for this dependent variable and for this combination of factors.

Two factors of scholarly behavior were significant. Research interest (Resinter) was significant only at 10%, but research involvement (Resinvol) had a high beta of .381 at p = .000. Scholarly behavior added 13.2% of explanation bringing the total to 50.1% for the whole model.

The model for the dependent variables books authored and coauthored (q35) and books edited (q37) was not significant. For more details refer to Appendix B.

Table 41 shows regressions for the dependent variable conference proceedings published (q36). Only the fourth, fifth, and sixth blocks were significant.

Similar to what happened to the dependent variable articles published, self-perceptions explained the highest variance, in this case, 17.4%. Also faculty research commitment (Me) had the biggest beta (.285 at p = .001). This factor was consistent throughout all the blocks.

Social contingencies made a significant contribution (p = .05) in blocks 5 (-.134) and 6 (-.131). Negative betas indicated that professor had some sort of family limitations to attending conferences and to publishing results at these meetings. This construct added 2.3%. The

whole model explained 23.7% of the conference proceedings variance.

Table 41

Variations in Conference Proceedings Published (q36) Predicted by Variable Sets

Models	1st Block	2nd Block	3rd Block	4th Block	5th Block	6th Block
Environmental Cond.						
Research equipment	-.036	-.035	-.030	-.010	-.024	-.030
Univ. teaching equip.	-.063	-.061	-.075	**-.115***	-.104	-.056
Index	**.140****	**.141****	.099	.003	.011	-.012
Environmental Response						
Environment resp.		-.010	-.054	-.083	-.094	-.097
Social Knowledge						
Trust colleague's specialty			.039	.037	.028	.044
Environmental trust			.012	.008	.019	.029
Teaching commitment			**-.123***	-.076	-.065	-.046
Immediate adm.			-.008	-.041	-.043	-.007
Next level adm.			-.072	-.044	-.046	-.041
Professor infl.			.083	.052	.052	-.001
Self-Know. Others						
Faculty traits				**.142***	**.135***	**.132***
Research commit.				-.008	-.016	-.025
Work values				**.119***	**.127***	.102
Self-know. Me						
Person standards				**-.191*****	**-.201*****	**-.177*****
Faculty traits				.014	.019	.014
Research commit.				**.285******	**.282******	**.161****
Work values				.096	.111	**.134***
Social Contingencies						
Family problems					**-.134****	**.131****
Scholarly Behaviors						
Research interest						.030
Grant research						.088
Diss. involvement						.090
Research involved						.139
Variance in %	2.7*	2.7*	5.1*	**17.4**	**19.1**	**23.7**

Note. Bold numbers are significant models.
*$p < .10$. **$p < .05$. ***$p < .01$. ****$p < .001$.

Since article production was the regression model that explained the highest percentage of variance, career

articles productivity (q38) was also used as a dependent variable, giving an additional career model of article productivity. As Table 42 shows, the results were diverse from the above models, yet not contradicting.

Table 42

Variations in Career Articles Productivity (q38) Predicted by Variable Sets

Models	1st Block	2nd Block	3rd Block	4th Block	5th Block	6th Block
Environmental Cond.						
Research equipment	.030	.009	.047	.047	.046	.069
Univ. teaching equip.	.088	**-.151****	**-.133****	**-.158*****	**-.157*****	-.072
Index	.090	**.305******	**.246******	**.126******	**.126****	.074
Environmental Response						
Environment resp.		**.175*****	**.125***	.082	.081	**.086***
Social Knowledge						
Trust colleague's specialty			**-.154****	**-.117****	**-.118****	-.068
Environmental trust			-.088	-.063	-.062	-.079
Teaching commitment			**-.104***	-.017	-.016	.001
Immediate adm.			-.023	-.022	-.022	.075
Next level adm.			-.042	-.003	-.003	-.010
Professor infl.			**.157****	**.109***	**.109***	-.007
Self-Know. Others						
Faculty traits				.001	.000	.003
Research commit.				.061	.061	.038
Work values				.010	.011	-.055
Self-know. Me						
Person standards				-.060	-.061	.004
Faculty traits				-.036	-.036	-.038
Research commit.				**.436******	**.436******	**.260******
Work values				-.046	-.045	-.004
Social Contingencies						
Family problems					-.010	-.026
Scholarly Behaviors						
Research interest						**-.180*****
Grant research						**.201******
Diss involvement						**.142******
Research involved						**.445******
Variance in %	**11.5**	**14.2**	**20.1**	**36.5**	36.5*	**61.4**

Note. Bold numbers are significant models.
$^{*}p < .10$. $^{**}p < .05$. $^{***}p < .01$. $^{****}p < .001$.

One of the differences in this model was the effect of factors such as environment response and index. These facts indicated somehow that environment response was important to promote research outputs throughout a professor's career. Something similar can be said about index or environmental conditions that surround faculty. In other words, faculty members tended to produce more in the span of their careers if they were employed by universities that were science oriented, had more faculty, were located in urban areas, had larger endowments, had larger libraries, and had higher research expenses. Trust colleague's specialty was significant with a negative beta (p = .05) in blocks 3 through 5, indicating that productive professors at these universities seemed not to trust their colleagues' specialization for their research productivity.

Also grant research and dissertation involvement were important factors contributing within scholarly behaviors (sixth block). This last construct added almost 25%, an important amount of explanation to the general model that explained 61.4% of the dependent variance.

Summary

This chapter presented the quantitative findings of this mixed-method study. Frequencies and percentages and

other demographic and descriptive statistics were provided. Regressions and factor analysis were also supplied. This summary highlights the key findings of this work.

For the descriptive findings, faculty members with highest research productivity tended to be those ages 41 and 50, male, from science departments, between 6 and 15 years at a university, tenured, in some level of administration, ranked as professor, and teaching both levels seemed to be more research productive.

Article research productivity (q34) was predicted largely by self-perceptions, when using regression findings. Faculty members highly committed to produce articles had higher reported research productivity. Scholarly behaviors was the second strongest construct related to research productivity. The model that included these two variables and others predicted about 50% of research productivity.

The regression model explained only 23.7% of conference proceedings (q36). Self-perceptions predicted 17.4% of conference proceedings, the largest amount of variance for this combination of variables. Social contingencies was a significant variable and contributed 2.3% to explain conference proceedings.

The model did not significantly explain books authored and coauthored (q35) and books edited (q37) as dependent variables.

Career article productivity seemed also influenced by environment responses to: professors need to produce articles, self-perceptions of research commitment, and scholarly research activities.

The results substantiated Blackburn and Lawrence's (1995) work in developing the theoretical framework that supported this research. These results went beyond their model by adding and testing the constructs Social contingencies and Environmental conditions.

The next chapter explores the qualitative data, gathered from voluntary respondents, that helped to supplement the quantitative results.

CHAPTER FIVE

QUALITATIVE RESULTS

This chapter reviews the qualitative data collected from an online open-ended survey and two face-to-face interviews. It also reviews the sample population, the qualitative procedures used to organize and analyze the data, and summarizes the main findings from this data analysis.

Data Collection

As was explained in chapter 3, 67 professors out of 277 survey respondents agreed to respond to an online open-ended questionnaire. Only 34 actually completed the seven open-ended questions and added demographic data. The online qualitative survey allowed anonymous responses.

In addition to the follow-up questions, two full-time professors with outstanding research productivity records were interviewed to help explore more deeply the meaning of these qualitative and quantitative results. These scholars were selected from an institution classified as PD (Professional oriented) according to Carnegie 2005

classification and belonged to the original group of 12 institutions in the quantitative study. Pseudonyms were used for the two respondents to protect confidentiality.

Discussion and Analysis: Follow-Up Questions

As was mentioned above, 34 respondents answered the seven questions of the follow-up questionnaire (Appendix A). Although not all of the 34 professors answered all seven questions, the replies can be grouped around the following order for each question.

Question 1

Question 1 asked: What reasons do you have to publish?

The most cited reasons were:

1. *Pressure for tenure and promotion.* "Part of my job description for promotion"; "to meet employment requirements"; "to maintain my standing in my university."

2. *Intellectual growth.* "To grow intellectually as a person"; "to enhance my own intellectual development"; "to share and test my thinking with others."

3. *Knowledge advancement and society improvements.* "Improve overall knowledge base and benefit society"; "to advance the current state of the art in my field."

4. *To refresh and enhance teaching.* "Keeps me excited about math and helps me share that excitement with my

students"; "I need to conduct research both to improve my teaching and to maintain my standing in my university."

5. *Professional prestige within and outside the university.* "Professional prestige & standing among colleagues in the field"; "keep pace with colleagues I respect"; "make myself more competitive on job market."

These responses fell within a very broad and common idea of investigation in American universities. Research is seen as one of the central missions for these institutions (Blackburn & Lawrence, 1991, 1995; Boyer, 1990; Fairweather & Beach, 2002). The reward system at these institutions of higher education is a constant affirmation of the importance of research for the betterment of faculty members, universities, and society (Leslie, 2002). These professors were in tune with the ideals and benefits of producing and publishing research.

Question 2

Question 2 asked: Do you consider yourself a successful researcher? Why?

Fourteen professors responded that, yes, they thought they were successful as researchers. Twelve answered no, they didn't see themselves as successful researchers. Eight

perceived themselves as somewhat successful. Their reasons and supportive quotes are provided below:

Those who responded yes had numerous publications over the years, such as books and articles. They were involved in the community of researchers, with research presentations at different refereed conferences. These scholars appeared to be well connected and well motivated to publish what they researched. For instance one of the professors said:

> Yes. I have published nine papers in the last seven years, have two currently submitted for publication and will be submitting another one in a month. I participate in conferences by giving talks and presenting posters. I am asked to regularly referee papers for respected journals and I write reviews of papers already published.

Those who responded that they were not successful researchers noted that time and resources to produce were perceived as limited. One interviewee stated, "Our professors teach 3 to 4 credit hours more than average and we are not paid to research." Some new professors viewed themselves as not successful but indicated a hope they would succeed in the future, for instance: "Not yet, primarily because I am a new faculty member and have just started. I expect that someday I will consider myself successful in research." These professors indicated a lack of connections to be supported and do research within the

universities, "No. I am not a trained researcher because I entered academia later in life. Writing in the style that they want is very difficult for someone with 25 years of industry experience." They also pointed out publishing research was not viewed as their primary role as educators: "No, Our professors teach 3 to 4 credit hours more than average and we are not paid to research."

Those who reported that they were researchers to some extent indicated they were in the process of developing a research agenda. Some of them expressed a limited interest in research with a stronger preference for teaching. These faculty members seemed to be caught up between different role interests and the proper conditions to publish: "No. I attend conferences, but have not done much by way of publishing in journals or books; it isn't from lack of desire to do so, it is from time constraints and money worries (extra teaching loads)."

Self-perceptions and motivations seemed to be the key to enhancing research agendas. Brown et al. (1996) found that efficacy perceptions affect one's ability to move from research training to publishing. This effect is stronger among women, who are more affected by self-efficacy perceptions in a given environment.

Question 3

Question 3 asked: What would help you be a productive researcher?

The unanimous primary answer dealt with teaching loads and time. Faculty mentioned several times that money to do research was important to them, funds for travel, graduate assistants, equipment, and the like: "'Looking for the buck' is a distraction that I have never been too good at. If only I had a small steady budget and a steady stream of (good) students, things might be much better." Human resources were also pointed out as essential. Better colleagues and graduate students would help professors to be more productive, as one respondent wrote: "More research-minded colleagues at my institution would help." Another professor said, "If I had a small steady budget and a steady stream of good students, things might be much better."

These findings are matched by several other researchers who found similar relationships between resources and productivity (Sax et al., 2002; Vasil, 1996).

Question 4

Question 4 asked: What institutional/departmental characteristics would help you to produce more research?

This question had overlapping responses with the previous question on what would help research productivity. The most repeated factors were teaching load, resources, colleagues and students oriented to research, colleagues in the same discipline, more graduate programs, and more money for research expenses.

An additional topic, mentoring, was also mentioned often. One of the faculty members said that he or she would like a "collaborative environment with a view toward partnerships' supportive administration." Another one asked for "better support for beginning research faculty." Yet another said, "clarity on expectations with step guidelines."

These faculty members were looking for consistent mentoring, with clear rules and expectations that would mark a path for them to follow. Administrators did not seem to be consistent and understanding of what research processes take.

Hunter and Kuh (1987) studied prolific writers and found that scholarly success is enhanced when a sponsor nurtures a researcher from the beginning. A mentor is an important source of stimulation for potential investigators to develop their skills. This guidance is especially

valuable for new professors. Confirming this finding, Perry et al. (2000) found that new hired professors needed a strong climate to nurture them to produce research.

Question 5

Question 5 asked: Do you think that your department promotes and mentors faculty research productivity? Why?

There were 14 professors who said their departments did not promote or mentor them very well to do research. Twenty said their department did help them and reported different levels of satisfaction with this support.

Those who said yes stated that institutions promoted more or less research due to the faculty promotion system. Some faculty members felt that there was a good mentoring environment; others did not feel that as much. Some examples were: "Promotes, yes, we are encouraged to do academic discourse, and when we do produce something, it is nicely recognized. But there is no serious mentoring. I feel I am pretty much on my own"; "In theory, yes. But in reality, there is a real sense that administration lacks appropriate support."

Those who reported their department did not promote research believed that professors and institutions had conflicting missions, which was a source of tensions. For

instance, one respondent said, "Most of our older faculty were not hired to be researchers, but rather to be teachers. Thus, none of them really does research." Another said, "None of them publish, they are scared of it and do not know what is going on in the field." Other conflicts of purpose mentioned were that "our priority is on faculty who engage with students. Doing research takes away from faculty interactions, so we don't."

Scholars at these universities appeared to be in an environment that had uneven situations. Some departments were promoting and mentoring research as part of their mission. But other ones struggled to get themselves into research. Inconsistencies of departmental and institutional missions were clearly sending contradictory messages to faculty, such as "Most of our older faculty weren't hired to be researchers, but rather to be teachers. Thus, none of them really does research. Non-research faculty are visibly threatened by the research productivity of newer faculty, and often hold it against them." Some professors mentored among themselves in an informal collaborative structure as this professor put it: "Informally, my colleagues and I are highly supportive of the various kinds of professional work each of us does, including but not limited to individual research efforts."

Other researchers found tight relationships between departmental mission and productivity (Creamer, 1998; Dundar & Lewis, 1998; Goodwin & Sauer, 1995). These ambiguous perceptions seemed to confuse faculty and reduce productivity.

Question 6

Question 6 asked: Do you think your institution should refocus toward more research? Why?

This question tried to explore faculty's perceptions of the importance of research in their department/institution and if a continued focus on that was promoted. Responses were divided among those who said yes, no, and those who saw a need for balance.

About half responded that their organization needed to do more research. They saw research as a positive thing that improved teaching, knowledge, and their university. The following statement was an example:

> This is a 'teaching college' but it suffers from lack of faculty who are abreast of the latest developments in their fields. People just keep teaching the same old material and the college suffers from low level of quality-we need more academic rigor!

This group of professors sees advantages in going toward a greater research emphasis.

Several professors did not see a need for more research. The main resistance was based on the institutional mission that is focused on teaching and serving students. Research is seen as hindering interaction with students and classes. Note the following responses: "We are losing our focus on students and quality teaching"; "We are a teaching institution. That doing more research would lessen our quality and our mission"; "We are a teaching college and almost every 'productive' faculty researcher I know is disliked by their students because they don't have time for them."

The following comments exemplify those very few who saw the need for balance. "The pendulum is now completely on the research side. It needs to come back to some equilibrium"; "I think we have enough of a research emphasis, but perhaps not enough appreciation of the differences in the nature of research in different disciplines." These professors seemed to be concerned with the institutional mission and its implications for both teaching, service, and research.

Fears of misbalance may also thwart research, as is pointed out in this quotation:

> Our board is pushing us in the direction of more research, but without funding the research or decreasing our teaching loads. Ultimately, both our

> teaching and our research will suffer. I prefer the ethos of teaching institutions (less competitive, fewer prima donnas on the faculty).

For these faculty members, balancing and putting the right equilibrium to their activities seemed to be crucial for both their happiness and the progress of their students. Similar problems are faced by big research universities (Middaugh, 2001), although their research culture is stronger (Campbell, 1997).

Question 7

Question 7 asked: Are there any other comments on these issues you would like to make?

This last open-ended question sought to elicit any opinions that might help one understand the work of faculty. Several select responses are reviewed below:

> I think your questions presuppose that there is a lot an institution can do to create great research. I'm doubtful. Most institutions I've seen with lots of great research got that way (a) by hiring people likely to be great researchers, (b) by providing them with the basics for such research (a decent lab, an adequate library, or the like), and (c) by staying out of their way (and not burdening them with excessive supervision, excessive restrictions, and so on). Part of avoiding excessive supervision is, I think, rewarding department and college for research, for example, by sharing some of the overhead payment with those levels.

Other investigations support the idea of research-oriented faculty producing more (Dundar & Lewis, 1998).

Perhaps this might be a way for some universities that are struggling between a teaching and research approach.

> Americans are increasingly concerned about "outcome" and "product." Many of our most talented earlier entrepreneurs and thinkers were initially failures or met resistance. Thinking creatively is not done as if you could schedule it at a particular time with pressure as if you were making widgets. Giving a positive environment and encouragement will produce students who want to learn, not have to do so, and professors who are excited about their research and teaching.

> My university is unusually backward in its approach to managing its employees, including (especially) its faculty. We have a number of outstanding groups/departments/programs and many others that are merely so-so. Those that are outstanding are aberrations; special conditions outside the general culture of the university and operating in spite of management and policy, not because of them, have led to high quality in these unique areas. More generally, faculty, at least in my area (and I have no reason to think that my area is special), are not included in policy decisions, not privy to management thinking on many issues that confront the institution, and not in partnership with administration. Although many faculty (in business, education and other areas) teach their students that inclusion and partnering between managers and employees is important and appropriate, our own senior administrators/managers do not practice and do not appear to value these principles or practices in managing the institution.

Finally, these seven open-ended online questions revealed new dimensions that are worthy of deeper follow-up research. Faculty responses uncovered feelings and perceptions about relationships between mission and resources. Also these opinions pointed out the need of

reviewing management styles that can thwart initiatives among professors.

Discussion and Analysis: Two Interviews

In addition to these email comments, I conducted two interviews. After analyzing these interviews, the information was grouped into common themes and stated experiences useful for explaining how faculty research gets done. The five themes that clearly arose from the interview transcriptions included (a) network, (b) professional environment, (c) research expectations, (d) faculty and university model, and (e) mentoring and nurturing.

Network

Both of the interviewees attributed their success in research production to early network connections built before and during their development as faculty at this university. Dr. Peter expressed the following:

> What has been important to my research is that I was part of a team from the very beginning. In fact, I was part of a team as a college student. The team back then was conducted by Dr. James who did excavations in the Middle East. I asked him if I could go with them to excavate and he said yes you could. One of his colleagues with whom I was taking one class offered for me to come and do some volunteer work. And I did that and then I went on the project and by being a part of his team I was introduced to other researchers and to a culture of research. . . . These connections helped me. We had a tradition of school of research and then stepping out and being connected in a wider

> world of scholarship. So I'm connecting every year with colleagues from Ivy universities who work with us. And that helped me to integrate to the whole profession.

The network that Dr. Peter acquired here at this university was a stepping stone for his future research and professional career. Also Dr. John strongly related his research productivity levels to his experience at another university.

> For me, my first 13 years of my career with the University of Miami school of medicine in Florida it was "publish or perish." If you did not publish two or three articles per year, you're fired. I went from instructor to full professor in 13 years; it was because I added a string of publications yearly. You know ... you don't get to the full professor without 30 peer-reviewed publications, it's that simple. And if you don't have about 20 after 7 years you're fired. So, it was "publish or perish." This is what you do, if you want to keep your job. You are a scholar, you are a productive scholar.

He had to produce a certain amount of research in order to keep his job. That forced him to develop research networks.

The research literature (Dundar & Lewis, 1998; Hu & Gill, 2000; Vasil, 1996) indicates that a better understanding and control of resources helped faculty to publish more.

Professional Environment

Other kinds of support are necessary, such as time and conditions for faculty to be free and to produce. Dr. John organized his department in a way to facilitate research.

> Here they expect you to teach four [classes], but we try and work so each faculty only teach three a semester if they are involved in scholarship. So we try to limit to three a semester. You have to be free to do research.

Resources and facilities are an important component of scholarly productivity. Faculty members have to be within an environment that can foster research. This was the experience of Dr. Peter:

> And I think the third thing that has been positive is that this happens to be one of—I guess you can call it—excellence in this university, so the university has provided a certain amount of resource to the archeology programs by means of good institute building and some staff time to work on research-related matters. On the whole I feel that this institution has been a very generous environment for me to work in.

Long and Fox (1995) pointed out that "resources in turn affect research productivity and ultimately scientific stature" (p. 51). Dundar and Lewis (1998) found correlations between better facilities and resources and higher faculty research productivity. So the environment where professors work is an important variable that affects the production of knowledge.

Research Expectations

What faculty members were required to do was embedded in goals, norms, and departmental expectations that generated a scholarly culture. Dr. John explained that there was a combination of interplaying factors:

> Within this department we enhance research or scholarship and it becomes part of the norms or expectations of the department. It is really peer expectations of how each profession will achieve and behave. So, this department requires research contributions. It is part of the norm of this department. We expect research as a norm. We don't understand if you don't. If you look at the statistics of the departments of biology, psychology, and behavioral sciences they are among the most scholarly in the university, what we call scholarly productivity points and all the scholarly research. So, we deal with a strong culture of scholarship.

However, most of these ideas depend upon leadership, as Dr. Peter asserted:

> As you may know this department is in the vanguard of research departments on campus, although the seminary has some strong departments too. Our chair and when I was chairing, we both pushed research and we got institutional support for it.

Dr. John agreed on the same concepts, saying that "This praxis came down from the last chair department and I'm trying to get continued on the same path."

Expectations have to be built and rooted not only as ideals, but as praxis that would create a set of policies and norms to regulate faculty's activities. The literature seems to echo these professors' statements. Perry et al.

(2000) stated that universities have an important role in modeling research expectations:

> Simply put, research productivity increased progressively in our new hires as a function of institutional emphasis on research, moving from those that placed least emphasis on research to those that value research and teaching equally or to research primarily. What these direct effects suggest is that research-oriented institutions not only appear to recruit faculty with certain control profiles, but that they also create environments that reinforce such dispositions. (p. 187)

Allison and Long (1990) found that the departmental expectations and culture regarding research are more important than hiring top faculty members.

Faculty and University Model

Both of the interviewees shared ideas regarding models of faculty and university. Research seemed to be very significant in improving teaching practices, thus enriching the interaction with students, helping them to learn more. For instance, Dr. Peter said the following:

> My teaching is very much benefited from my research to the point that I'm able to go in a class and give lectures in my classes that are always fresh because they are representing the latest reading, thinking, and conversations, and reflections. They are much more spontaneous and they exude certain enthusiasm that I think it's important for good teaching. Rather than regurgitating 30 years of notes ... it just doesn't happen in my classes. I'm very much incorporating my research into it when I teach.

Dr. John went further, saying that professors must advance their professional field. That is part of their mission. In doing so, they will become better teachers:

> If you are not a scholar, how can you train them to be professionals? If you aren't contributing to the advancement of your profession, how can you possibly train other to be professionals? While you are training them in the work of others. It doesn't make you a strong place. The strongest places are advancing your profession. And this is how they train the next generation. If they are not advancing their professions, how can they train the next generation? They are just repeaters of the works and discoveries of others. Doing both teaching and research takes time and it isn't easy. I always argue that you are a better teacher if you are engaged in discovery. The students have more respect for teachers if they see their research and textbooks. And students have better chances of getting into a good graduate school, a better job if they publish.

Moreover, students will benefit from a high-profile professor who steps down and helps them to get involved in research.

A Christian university should also promote a model of research involvement. That will bring better training for students, as Dr. Peter affirmed:

> Those parents also want for those students to have the best value for their money. And they do not know how a university generates values for their students. But as faculty we know. It comes as faculty being respected in their fields, seeing as active producers of new knowledge and that's sort of a sense I feel that in order to their growing demand and excellent education for their kids I also need to do research.

Dr. John discredited the definition of "teaching-university" as not appropriate for a university context. Universities are different from other educational institutions because they produce knowledge:

> Universities are places where discovery happens. If you are not writing the text, if your materials are not in the text, why bother calling yourself university? Don't hyphen yourself with "teaching-university." There is no such thing as a "teaching-university." What is that? Universities are places of discovery. Universities are places where you discover, not only repeat the works of others. It is where you create the knowledge that you teach to your students. If you are just repeating the works of other, you are not a university.

To these two professors, both faculty and university roles are not clear at this university. Smeby and Try (2005) pointed out that departments with a high proportion of qualified researchers attract other qualified and productive faculty. This may explain why there are some differences in research productivity among departments.

Mentoring and Nurturing

Dr. Peter and Dr. John expressed appreciation for the support received by colleagues, in both formal and informal mentoring relationships. This comment appeared more often than any other theme in the semi-structured interviews with both participants.

Mentoring students to do research seemed to be strongly related to success as a researcher and professional. Dr. John argued that mentoring students is one of the most important functions of a university:

> I look for people who want to be good scholars. And so when I hire I want them to be interested in scholarship and doing research and most importantly mentoring students in their scholarship research, not only that we produce a lot, but generally produce with students. I always argue that you are a better teacher if you are engage in discovery. The students have more respect for teachers if they see their research and textbooks. And students have better chances of getting into a good graduate school, a better job if they publish.

Dr. Peter had similar thoughts:

> Here I'm doing the same thing with my students. I've been in a team with them. I'm reproducing the same thing with them. For instance, they are working on different parts of my research just as I'm part of a team. Now I'm reproducing the same environment here. For example, in this big study of Palestine that I'm conducting, we're looking for the different empires that have marched through this region, so some of my students are working on a separate empire like Romans. Some students are being connected to a project that linked both theoretical and significant problem and empirical context and tools to do that. I had students getting into Columbia University last fall; I had students getting into the University of Michigan because they've been active in research, even as undergraduate students.

Another important type of mentoring is related to faculty. Dr. Peter asserted that he was and is involved in mentoring colleagues to develop new research projects: "I've done some mentoring because Steve has worked with me

here in the seminary and I sort of pulled him in. He asked me to help him to publish something."

Dr. John has also been involved in mentoring and promoting scholarly activities for all the faculty of his department:

> We work together, we support together, we encourage together, and we help each other in terms of teaching a class if you are presenting somewhere. We are very supportive, expecting it and supporting you in order for you to meet your scholarly goals.

Departments with a highly collaborative climate that fosters teamwork were more productive, according to Smeby and Try (2005). Moving to prestigious universities increased professors' research productivity, independent of earlier publishing activities (Bodenhorn, 1997). Similarly, Long and McGinnis (1981) concluded that scholars appointed to new positions will adjust to the characteristics of those new contexts within 3 to 6 years, regardless of their previous publishing records.

In conclusion, opinions from these two interviews set clear outlines for conditions to have higher levels of scholarly productivity among faculty. Professors and students need to be taught and trained in research skills in order to be productive. Nurturing an environment that would facilitate supporting faculty to create research seemed to be stressed as a key factor. A promoting

environment appeared, according to these professors, related to mission and expectations within a department and university.

Conclusion

According to the above data, successful researchers seemed to be in environments that foster professional development, research expectations, a network of connections that facilitate interaction with other researchers throughout the world, and a mentoring context that helps them to increase their potential along with others. These conditions appeared to be crucial to enhance research productivity.

Among the limitations professors mentioned, teaching loads and time to do research were the most repeated issues that hinder productivity. Restrictions about budget, quality of students, and colleagues were also mentioned as negatively affecting productivity.

Finally, faculty research productivity emerged as linked to a different ideal of roles for professors and university. An unclear and sometimes contradictory perception of departmental and university mission was evident in the data. Opinions about integrating teaching and research were conflicted in several faculty members.

Research was very often seen as competing with quality teaching and time spent with students. However, productive members showed strong orientation to discoveries as a main activity and saw a positive relationship between teaching and research.

CHAPTER SIX

FINDINGS, CONCLUSIONS, DISCUSSION, RECOMMENDATIONS, AND SUGGESTIONS

The purpose of this chapter is to summarize the study, state the main findings and conclusions, and discuss the recommendations for practice and suggestions for further studies.

Summary

Since the Bayh-Dole Act (1980), a new entrepreneurial environment is challenging the traditional view and mission of some universities (Powell & Owen-Smith, 1998; Slaughter & Leslie, 1997). Entrepreneurial faculty and university research systems are reshaping communities and businesses through knowledge production with practical applications (Kezar & Eckel, 2000; Meyer, 2003). However, some small and medium doctoral research universities are struggling to produce knowledge and keep pace with these changes. It is crucial to understand the personal and organizational characteristics of successful researchers that can promote

or discourage research productivity (Siegel et al., 2003; Tien, 2000).

The purpose of this study was to investigate the influence that organizational environment and personal characteristics of faculty members have on faculty research productivity (FRP) at selected not-for-profit, private, doctorate-granting universities.

The general question guiding this study was, "What are the environmental and personal characteristics that relate most highly to faculty research productivity at small- to medium-sized doctorate-granting universities?" Research questions resulting from this main question were:

1. To what extent do different personal variables such as demographic characteristics and career-achieved experience relate to faculty research productivity?

2. To what extent do (a) environmental conditions, (b) environmental responses, (c) social knowledge, (d) self-valuation, (e) social contingencies, and (f) scholarly behavior relate to faculty research productivity?

This investigation used the theoretical approach created by Blackburn et al. (1991) and Blackburn and Lawrence (1995). However, this study developed new variables to measure the influence of exogenous environmental conditions and social contingencies on FRP.

A mixed methodology was used to investigate the faculty's perception of the effect of institutional environment and personal factors on faculty research productivity.

Of 39 small- to medium-size private, not-for-profit, doctorate-granting universities in the United States, 12 universities participated in the study with 277 respondents to an online survey. Qualitative data were generated from an open-ended online survey of 34 professors who agreed to do a follow-up of the quantitative survey. Two face-to-face interviews were also conducted.

Findings

This section reports the findings for the whole investigation by sections. Table 43 summarizes the quantitative and qualitative results combined with some extra comments that provide an overall analysis of what was learned about the environmental and personal factors that faculty believed influence research productivity within the last 2 years prior to the data collection in 2006. The following sections help to explain this chart.

Table 43

Combined Findings

Data Processed	Factors most related to research productivity: Quantitative Findings	Qualitative Findings	Commentaries
Multivar.	Ages (41-50)	Not mentioned	These socio demographic and career characteristics did relate more highly than others to the article productivity.
	Gender (Male)	Indirectly inferred from open-ended survey	
	Area (Science dept)	Not mentioned	
	Employed (6 to 15 yrs at university)	Not mentioned	
	Status (Tenured)	Mentioned in open-ended survey as a career goal that fuels publications	Oddly, only tenured was mentioned in the qualitative data. A lingering question is why these factors in the multivariate analysis were not in the attention of the open-ended responses?
	Role (Some adm. duty)	Not mentioned	
	Rank (professor)	Not mentioned	
	Level (Teach grad. and undergrad)	Not mentioned	
Regression	Articles: Moderate environmental conditions	Open-ended mentioned better equipment and resources for work	Commitment to do research was without doubt the most important variable for article productivity.
	Strong self-knowledge	In open-ended survey and interviews, productive researchers expected to produce	
	Strong scholarly behaviors	Open-ended survey and interviews mentioned networking professional growth, and hard work to publish more	
	Career articles: Moderate environmental response	Open-ended and interviews stressed nurturing and departmental support	Productivity over career was affected strongly by scholarly behaviors. Also the way environment responded to faculty needs was influential.
	Strong self-knowledge	Open-ended and interviews stressed	
	Very strong scholarly behaviors	Open-ended and interviews stressed	
	Conference proceeding: Strong self-knowledge	Open-ended stressed and interviews	
	Moderate social contingencies	Not mentioned in qualitative data	Family problems exerted influence on productivity too.
	Models for books authored and coauthored and books edited were not significant	N/A	

Table 43-*Continued.*

Data Processed	Quant. Findings	Qual. Findings	Commentaries
Open-ended survey and Interviews (Items not listed in quantitative findings but showed up clearly in qualitative data)		Negative factors: Teaching loads and time to do research Budget Quality of students and colleagues to do research Factors creating conflicts: Roles and mission of professors and university Teaching vs research Time spent helping students vs time devoted to research	Promoting and providing research activities seemed to be a key element. The mission for university and department was a source of divided opinions that may explain low research productivity. Productive members showed strong orientation to discoveries as a main activity and saw a positive relationship between teaching and research. Future research should include more detailed questions related to these qualitative findings.

Quantitative Findings

As chapter 4 showed, descriptive statistics and regressions were used to show the relationships of socio-demographic, career-achieved experience, self-knowledge, social knowledge, environmental conditions, environmental responses, social contingencies, and behavior to the dependent variables, which measured research output. This output was measured by scholarly articles and books published within the last 2 years (q34-37), as well as those produced over a career (q38).

The six constructs of factors for the regression model explained 50.1% for article production (q34) in the last 2 years and 61.4% for articles in the whole career (q38). The main constructs producing regressions were self-knowledge and scholarly behaviors. The model explained 23.7% of conference proceedings published (q36). Self-perceptions and social contingencies constructs gave the most significant explanation for this dependent variable. Models for books authored or co-authored (q35) and books edited in the last 2 years (q37) were not significant.

Qualitative Findings

The open-ended surveys and interviews added many new factors as having potential influence on research. Some of these were evident also in the quantitative data. But many others were uniquely mentioned in the qualitative data (see table 43 for more details).

Faculty research productivity seemed to be encouraged by an environment that nurtures professional development, research expectations, a networking with other researchers within and outside faculty's department or university, and a mentoring atmosphere that promotes commitment to research.

Although environmental conditions varied from one department or university to the other, professors mentioned over and over the need for more time and resources to produce research. Colleagues with a similar field background were said to help stimulate their research. Having good students and a budget to develop research projects were also cited as important factors.

Finally, faculty members from these universities expressed conflict about their roles. The majority admitted the importance of producing scholarly work as a positive effect for their career, teaching, and profession, in general. However, the same group appeared divided when asked about what emphasis their department/university should take toward research. The main contradictory points of view emerged around time distribution. Professors felt time devoted to research would diminish their quality time with students. Different conceptions of missions and faculty roles were noted to exist in a department, which feed into this conflict. These individuals seemed to struggle with what their roles were and how to balance these roles. Differing views in the department only helped to make that conflict more intensive.

Conclusions

The purpose of this study was to determine faculty perception on which institutional environmental and personal factors relate to faculty research productivity. Overall, both quantitative and qualitative results pointed to self-knowledge as the strongest factor that contributed to produce research outcomes. Professors who were self-committed to advancing knowledge seemed to generate scholarly work regardless of their environment.

Scholarly behavior was also an influential factor. Interest and involvement in research showed a tight relationship with productivity. These behaviors were important even for career productivity. These included research interest, research through different types of grants, dissertation involvement as chair or committee member, and research involvement recently and throughout career.

Regarding resources for faculty members, teaching load and budget limitations were among the most influential elements affecting research productivity. Also lack of appropriate research facilities, colleagues within the same discipline, and quality students to do research were mentioned as important.

According to qualitative data, mentoring appeared weak and uneven for most opinions, although it seemed to be a powerful influence over faculty to become more research productive.

Professors expressed disparities regarding the mission and role of themselves and their department/university. Conflicts of view regarding the integration of teaching and research were shown. These conceptions seemed to play a key role in faculty research productivity.

Discussion

Following the literature review and data from this study, it seems that traditional roles for universities are being challenged. Higher education is facing environmental changes that force universities to be more entrepreneurial, bringing in activities and organizational values not seen a few decades ago. This is especially true for the sample of small and medium institutions studied.

What might be an obvious research mission for a major research university may not be quite clear among small and medium private universities. These universities have evolved from colleges to full doctorate-granting schools. Thus these institutions find themselves at a crossroad that is pushing them to a more proactive research agenda (Serow

et al., 1999). Constituency, administrators, professors, and students are part of this institutional culture reshaping.

There is much at stake. Administrators seek to expand research productivity as a way of bringing prestige and resources to an everyday more competitive market. Professors at small- and medium-sized universities seemed to have a mixed reaction regarding research and teaching activities, not to mention tenure and promotion (Wolverton, 1998).

In the context of important institutional changes, what can be of help to produce more research? Taken as a whole, the findings of the present study clearly indicate that self-perceptions (self-knowledge) about research importance seemed to guide faculty to produce research in spite of a rather low performance environment given at these universities. Reaching the status of tenured professor, the advancement of knowledge and teaching, prestige, among others seemed to be the stimulus driving faculty to publish, according to both qualitative and quantitative data. Although there were several motivations for faculty to value publishing as an important role for their career, commitment to research was highly related to advanced levels of productivity. However, and echoing other

studies (Clark, 1997; Massey & Zemsky, 1994; Serow, 2000), this is partially true. Or put in other words, is it only a matter of personal choice? What can be done to boost faculty research productivity? Data and literature suggested that universities can do many things to advance research productivity. In fact, Leslie (2002) found that faculty without the proper stimulating pressure for publishing may lead them to lower their productivity.

Different scholarly research (Creamer, 1998; Hunter & Kuh, 1987; Leslie, 2002) found that institutions can press on to create the right environment to stimulate research. Universities that promote and expect professors to do more research tend to have higher productivity. Interviews evidenced that faculty members immersed in a nurturing department culture can thrive and produce in spite of the financial limitations. However, the data showed that several faculty expressed concerns about their difficult situation. From one side they feel the pressure to produce more, but from the other the conditions and environment response were meager or inadequate. Creating a culture of mentoring might be one way to resolve these conflicting environments.

In this study, the scholarly behaviors construct had a significant share of explanation, especially for article

productivity. The more involvement in conferences, presentations, grant proposals, and the like, the more production. This was similar to previous findings that professors with higher levels of productivity showed a wide network that went beyond the walls of their department and university (Smeby & Try, 2005). How did this happen? Successful researchers evidenced a stimulating departmental environment that helped them to evolve to higher levels of productivity. Perry et al. (2000) confirmed this finding saying that institutional climate is a key factor for newly hired professors who are on their way to be more research productive.

Kolpin and Singell (1996) arrived at a similar conclusion that "the research productivity of a faculty member is not simply a function of individual skills but is also affected by the 'quality' of colleagues" (p. 421). Data from this study showed the same evidence. An outside network of colleagues can also supply some of the departmental limitations, although large department size is ideal for productivity (Meador et al., 1992). The quality of partners to do research can also be boosted with better students who help faculty to potentiate time and outcomes (Levitan & Ray, 1992). Some professors from the open-ended survey pointed out this factor as a way to publish more.

Another important contribution from this study was the influence, in the long run, of resources understood in a broad sense. It can be very hard for a professor to produce high-quality research reports without the proper time balance. Supporting these findings, Copp (1984) expressed that "the top five inhibiting factors for research productivity were 'Lack of time, heavy teaching workloads, lack of preparation and commitment, lack of adequate funding or funding solely for teaching, and too few prepared or credentialed faculty members'" (as cited in Collins, 1993, p. 163). Administrators must provide the environment for professors to produce, giving them the time and budgets to supply their needs for research.

The data also evidenced that there are some challenges to be faced. Opportunities for women and minorities are still a nationwide problem (Perna, 2001; Sax et al., 2002) and this was reflected in this study. The institutions sampled matched what is happening nationally where Caucasian male faculty dominate the professorate landscape. These differences might be a consequence of social roles on one side (Fox, 2005; Stack, 2004) but also could be an effect of a long tradition of resource-controlling patterns (Gander, 1999; Koplin & Singell, 1996; Vasil, 1996). If research performance is to continue to be a predominant

criterion in an institution's faculty reward system, then administrators must ensure that women and minority faculty have equal access to the experiences and opportunities that are satisfactory to promote research productivity.

Another area of challenge was the less productive departments. According to several studies (Anderson, 2001; Bradley, 2000; Gander, 1999), science-oriented departments and universities have much more research productivity measured by publishing articles, books, and the like. This was also mirrored in this study. However this is a fact: There is room for administrational policies to try to balance and expand research in other departments too. Perhaps the approaches should be different, taking in account the disciplinary differences.

One of the key factors mentioned in the follow-up questions was the conflict faculty noted between teaching and research. Several studies (Lee & Rhoads, 2004; Marsh & Hattie, 2002; Patrick & Stanley, 1998) found that teaching seemed to be negatively correlated to research endeavors. However it was demonstrated to be conflicting for many professors, there is a value of intellectual growth that research brings to professors, to their discipline and teaching, and to society through discoveries (Slaughter & Leslie, 1997). Fairweather and Beach (2002) also found that

only 22% of the faculty were productive both in teaching and research. Perhaps for reasons like these, professors appeared to have problems in identifying their university's mission. Multivariate analysis gave evidence that teaching in both the undergraduate and graduate levels helped research productivity. Why did teaching in both levels help research productivity? This finding remains to be explored in further studies.

Another cause for this confusion may have been the shift from a traditional teaching approach to a more research orientation during the last two decades (Becker & Lewis, 1992; Bowie, 1994; Callan & Finney, 1997; Duderstadt, 2000; Lapidus et al., 1995; Slaughter & Leslie, 1997). These mission changes must be addressed by academic administrators to unified productivity procedures at least at the departmental level. As Blackburn and Lawrence (1995) put it, "The shared understanding of the institution's mission and of what is central to a particular academic unit in part shapes decisions about awarding tenure or committing institutional resources to faculty projects" (p. 18).

Another crucial issue is the way faculty research productivity is measured. It might be that other types of measures would have given more indications of the factors

influencing research. It could be other indicators may be more accurate. The dependent variable, articles published, was by far the best answered. Books authored, coauthored, or edited were difficult to predict or even to track within the last 2 years. Probably a broader account of research published should be included to have a better picture of faculty activities. One example of this is professors from the art sciences and humanities. These disciplines should be measured in a different way.

In sum, the aim of this area of research was to determine which aspects should be taken in order to have the best research performance within the selected universities. Overall, many of the factors identified from either quantitative or qualitative finds were similar to those found in other studies. However, unique factors and relationships were also indentified here. It can be inferred from this study that these institutions should reshape their mission statements, provide more resources for scholarly activities including time, and foster a mentoring culture to capitalize the already productive professors and to welcome the new ones to a nurturing environment that would boost their academic career regardless of their personal and social background.

Recommendations

According to these findings, and from an organizational point of view, administrators from small- and medium-size universities who want to develop a stronger research agenda may want to consider the following:

1. *Review mission statements.* Data showed that professors from the 12 universities thought there were problems with the mission of their department or institution related to research. One of the repeated complaints of some was the lack of clear goals and expectations related to research. It may be crucial for these universities to develop strong vision and mission statements that emphasize the research identity of the organization. Or it might be necessary for those departments within the universities more closely tied to research to modify internal mission and vision statements that promote research role identification. Examples of that could be stronger research requirements for hiring faculty or have higher benefit packages for those hired who have more extensive research publications. Mission statements can make sure that research requirements for promotion and tenure are more challenging and enforced in the promotion process. Annual review and merit pay could be used to encourage research publication.

2. *Strengthen mentoring procedures.* The literature suggests, along with the data, that there is a process of guiding and supporting faculty to develop skills necessary to accomplish research. Some of the findings suggest that mentoring should be given more structured attention. This is especially true for new faculty members, such as assistant professors and female faculty. But it is also important for all ranks, since mentoring is a nurturing process to stimulate and help faculty to produce more (Hunter & Kuh, 1987). Mentoring would include more than talking about a research agenda and inspiring desire. It should be organized in structures with time and resources available for faculty.

Several practices could be used to strengthen a mentoring process on research for faculty. First, departments can sponsor induction seminars that show new faculty about research and grant processes and forms of the university. Related to this induction could be the creation of a "rookie" notebook that helps new faculty know about the ins and outs of working as a faculty at the university. This notebook could include material from the human resource departments. Second, create a formal mentoring requirement that is built into the department, such that each faculty was either mentoring or being mentored. This

relationship would be included in annual reports of professional activity. Although the program would be formal, the actual pairing for mentor-mentee relationships could be based on an informal process guided by similar interests, the pairing personalities, etc. Third, another practice would be weekly meetings between mentor-mentees to discuss research and progress toward research goals. Much can be accomplished in 1-2-hour meetings focused on research discussions.

3. *Hire professors with research experience*. Some of the professors interviewed suggested that faculty with more research experience would enhance overall faculty productivity. This suggestion also matches previous studies (Kelly & Warmbrod, 1986; Perry et al., 2000). Career background had a significant influence on article productivity. Universities or at least departments that want to grow more faculty research productivity may use new hiring as a way to increase publications. However, according to Bland, Center, Finstad, Risbey, and Staples (2006), most of the scholarly productivity is significantly higher for tenure new hires than for non-tenure new hires. These scholars already have a research commitment and experience as well as a self-perception of success that may help them to develop stronger departmental commitment to

provide the right conditions and expectations to stimulate research (Meador et al., 1992).

4. *Release more time and resources.* More release time or balance between teaching and research was often raised as the most difficult barrier for research productivity. Many professors complained about the teaching-versus-research-time ratios as disproportionately in favor of teaching. Developing more creative teaching schedules and departmental plans for faculty research time may be possible and help to change faculty habits and behaviors to allow research work (Dundar & Lewis, 1998). Creating internal seed grants and equipment funds may encourage faculty members to leverage time and resources to engage in research. Later, once faculty have created connections with other organizations, they could also find more funding to buy out portions of their teaching work.

5. *Involve more graduate students in research.* Although not directly noted in most of this study, one factor emerged that bears inclusion here. Because these small to medium research universities have a significant doctoral and graduate population, faculty research productivity might be increased through the better use of the graduate assistants. Some professors complained about the quality of students as a factor that diminished

research productivity. Student assistance could help not only complete work of research agendas but also increase creativity in doing new types of research. Schools with graduate programs and good graduate students have an asset that needs to be tapped not only for the benefit of students but also to help faculty expand their research projects (Kotrlik et al., 2002). Graduate students can coauthor papers and research reports under a professor's advice, thus giving graduate students career advantages. Graduate programs may also seek to restructure course and overall graduate leaning to facilitate faculty-graduate student publication and work (Golde & Walker, 2006).

There are several ways to encourage this collaborative work. One way would be to require publishable material from students at the end of a course or year of study. A simple start to this would be to require publication of book reviews in major journals, which is an easier way to get into the routine of publishing. Another way is to require students to attend conferences as part of course work or completion of program goals. Faculty can support this process by providing some funding to help with student travel, especially when they present their research. Furthermore, students can be paid as research assistants to help with literature searching and reviewing,

and gathering data. They then would be included in with the authors of the research.

6. *Centers of research*. Data evidenced that faculty with wide networking with other scholars, beyond their departmental limitations, were in a better position to produce research. One way of improving networking is centers of research. Faculty members can cluster around centers that match personal and departmental interests. This suggestion is also supported by the literature. According to Bunton and Mallon (2007), professors who are center-affiliated were more productive than their non-affiliated peers. They also were more likely to be principal investigators with externally funded projects. Center-affiliated professors most likely experience a synergy of research ideas and collaboration that others do not; they have access to better resources, more publishing opportunities, and more interaction with prestigious colleagues than do those without such affiliations. Also Corley and Gaughan (2005) found that center-based faculty spent significantly more time writing grant proposals, conducting funded research, and administering grants. University research centers can bring innovations that otherwise would not develop without them (Boardman & Bozeman, 2007).

One way to help this happen is to continue to foster a strong expectation of collaborative research in each department. This can be created by Deans or chairs through providing larger seed grants from central administration to projects that come from a collaborative research center or group. This helps to increase capacity building between researchers, which essentially develops a center of research in the university. Establishing a physical place for this center can also help further a sense of space and identity for an emerging center.

7. *Scholarly involvement*. Lastly, data showed that research commitment was the most important variable along with scholarly activities to especially produce articles. Faculty attending conferences, whether or not they have papers or research reports to be presented, will keep alive a passion for research and thus will be updated in their fields of expertise. They also should be promoting graduate students to attend research meetings and help them to author or coauthor articles and papers for conferences. They should create the synergy to produce changes in their departments. This could be a slow process and at times frustrating, but certainly effective in the long run.

Further Research

The findings from this study suggest many new directions for studying faculty research productivity, especially for small to medium doctoral research universities. These include:

1. *Environmental perceptions.* Although Blackburn and Lawrence (1995, p. 143) found similar results to this study, it is clear that varying the type of questions asked to researchers can help uncover dynamics of research that occur in universities. One possible way of unveiling new influences on research may be to conduct a set of qualitative open-ended interviews similar to ones done in this study. Those interviews might be used to generate questions that could help to map professors' perceptions about their university environment. This was evident in that many factors found in the qualitative data were not clearly addressed in the quantitative analysis.

2. *Environmental conditions.* This study and previous research point out a wide range of factors, such as resources, facilities, colleagues' expertise, and salaries, directly or indirectly affect research publishing. It could be that a constellation of factors may be at work in places were productivity was higher. An index could be created to help to find new environmental conditions contributing to

improve productivity. This index could provide comparison data to determine, for instance, the minimum size or the characteristics of research-productive units.

3. *Mission statements*. More study could be done on how mission understanding is related to research behaviors. Interviews could be used to explore contradictory interpretations of departmental and university missions. What mission statements are linked to effective research? Are there any common mission statements or themes to successful departments or schools? Studying the relationship between mission statements and research might empower administrators who are looking for ways to inspire and guide research growth.

4. *Departmental factors*. Data from this study suggested that some departments can be more productive than others in the same university. A pattern of more productive departments revealed irregular publishing outcomes. Internal policies, resource distribution, climate, departmental leadership and other factors may explain these differences. Exploring why those exist would be useful research.

Based on the literature review and findings from this study, the following hypotheses may be tested in further

investigations to explain faculty research productivity at the departmental level:

1. The higher the departmental research expectations and demands, the more faculty research productivity (FRP).

2. The greater the teaching emphasis of the department or university's mission, the less the FRP.

3. The more networking with resources and high research-motivated colleagues, the more FRP.

4. The more a faculty member is exposed to a research-mentoring environment, the more FRP.

These statements might be grouped as the preliminary stages of what can be called "Departmental Environment Productivity Theory (DEPT)." Such departmental environments may be shown to be effective in predicting research productivity. I am currently developing this area of research.

Further Discussion

Increasing research productivity in small to medium doctoral research universities in the future may also depend on shifting to new paradigms on research.

Most universities are interested in using their knowledge resources to have a positive influence on communities and to develop a commitment of service among

students. Developing such a service focus was one of the four university dimensions noted in the revolutionary report by Boyer (1990) on scholarship. Bringle and Hatcher (1996) remarked that universities are not bridging theory with practice in terms of social issues. They predict a time when colleges will be more proactive, integrating with communities: "The 'New American College' will take pride in connecting theory to practice in order to meet challenging social problems, particularly those faced by universities in urban settings" (p. 221). Eisenmann (2004) also shared the same concern when she referred to a recent survey of Association of Higher Education (ASHE) members. There is "some disenchantment with higher education scholars' seeming penchant for studying increasingly smaller parts of collegiate issues without wider contextual analysis" (p. 8). It could be that research productivity itself might be reconceptualized, especially applied or active research.

Johnson (1998), based on Boyer's work (1990), argued that universities must be run on broader missions to reach society as well (Braxton et al., 2002). Bensimon, Polkinghorne, Bauman, and Vallejo (2004) went even further when they stated that the need for bridging research and the real world is affected by the methodology of knowledge production (p. 104). They proposed a practitioner-as-

researcher model, as follows: "In the traditional model the individual identified as the researcher controls the production of knowledge; in the practitioner-as-researcher model, stakeholders produce knowledge within a local context in order to identify local problems and take action to solve them" (p. 105). Waghid (2002) suggested something similar when he called the traditional "Mode 1" of solving problems focused only within a disciplinary context, whereas the alternative "Mode 2" of solving problems was carried out within a specific context of application involving other participants such as students, parents, communities, educators, and other groups (p. 467). This approach of knowledge would enrich even scholars.

Checkoway (2001) provided evidences saying that the engagement of faculty in community service and interaction, also called "the scholarship of engagement," has benefits for both the faculty and the institution, as he put it:

> It provides faculty members with new life experiences outside their professional circles that can stimulate research and improve teaching. It causes them to interact with people often very different from themselves and can provide them with new ideas for research and improve teaching. There is evidence that faculty who consult in the community are more productive researchers and better teachers than those faculty who do not. (p. 136)

Universities need to shift their overemphasis on specialist knowledge to make it a more context-approach that would lead to a better bond with service.

The second major area that will need to be addressed by universities that want to increase research productivity will be creating better relations between teaching and research. Some universities are making significant changes and efforts to balance teaching and research. For instance, Ohio State University is distributing funds among less productive departments such as English and Business to give them resources to apply reforms in workloads. Michigan State University is implementing new promotion and tenure guidelines that apply to all faculty members irrespective of college, department, or program (Wolverton, 1998).

Qualitative data from this study revealed that many professors see conflicts in viewing research and teaching missions as one. As Clark (1997) put it, this is not a matter of teaching or research orientation:

> We need to move conceptually beyond the dichotomy of research and teaching. Drawing a fault line between these two principal faculty activities, the incompatibility thesis portrays teaching and research as distinctively different operations that are basically opposed to each other. (p. 252)

Many universities (Cummings, 1998) are struggling with the idea of balancing research, teaching, and service as

accepted mission for schools. The following quotation makes it clear that there are some "winds of change":

> But at least in the United States a host of political and economic trends, both national and local, are forcing a significant minority of America's research universities to re-examine their mission, to reconsider the balance between teaching and research, and between these more traditional functions and the challenge of reaching out to external audiences (through what is variously referred to as public service, professional service, and outreach). A similar tendency can be observed at the collegiate and community college level. (Cummings, 1998, p. 70)

A third issue facing small- to medium-size universities is institutional identity and the need for differentiation in higher education. Too many institutions seem influenced by what Di Maggio and Powell (1983) called isomorphism. Dey et al. (1997) examined the homogenization (isomorphism) of American higher education. Universities and colleges are copying each other and blurring differences among themselves such that uniqueness is being lost. "As a result, institutions become less distinctive in form and character. These pressures are driven by strong economic and professional considerations and tend to promote institutional homogenization faster than institutional differentiation" (Dey et al., 1997, p. 309). Riesman (1958) describes the process of isomorphism like a "snakelike academic procession" where the head (leading universities) moves, the body (the rest of universities)

follows (as cited in Dey et al., 1997, p. 309). The major problem with this standardization of academe is that higher education may not be richly diverse to meet the extensive diverse needs of American society.

Fourth, a word should be said about the traditions that guided the founding of most of these 12 universities. Opinion should also be asked to their constituency. Ten institutions were Professional Oriented (PD) and all had a religious background. With different degrees of influence, churches created, funded, and stimulated these institutions. Rethinking their institutional missions in the context of major social, cultural, and financial changes is probably the biggest and most challenging task ahead for these institutions. It might be the most influential factor affecting faculty research productivity.

APPENDIXES

APPENDIX A

COVER LETTER AND SURVEYS

January 20, 2006

Dr. John Smith
Vice President for Academic Affairs
X University

I'm a doctoral student at Andrews University in Michigan working on a dissertation that is studying the factors that influence faculty research productivity at 39 not-for-profit private doctorate-granting universities (Carnegie Classification, 2005).

Across the country faculty are working hard to produce research. This is especially true at small and medium size universities. My study examines some of the predictors influencing faculty research productivity. The results from the study will help faculty and administrators better understand the factors that most relate to research productivity.

I am requesting the opportunity to email the web link to all your part and full time faculty. Individual responses will not be shared with anyone. References made to responses in the dissertation or subsequent articles will not compromise informant confidentiality. With your permission, I can send an e-message (with an e-link to the survey) to you for you to forward to your faculty with an encouragement of their participation.

The survey should take about 20 minutes to complete. Here is the link to the questionnaire:

http://www.zoomerang.com/survey.zgi?p=WEB224XU8QZW5T

If you have any questions or concerns with regard to my participation in this research project (IRB, forms, protocol, etc), you may contact either me, the researcher, Gus Gregorutti at ggregoru@andrews.edu (Tel: 269-473-2063), or my advisor, Dr. Duane Covrig, professor in Educational Administration and Leadership at covrig@andrews.edu (Tel: 269-471-3475).

Thank you for your help with this project.

Sincerely,

Gus Gregorutti

Ph. D. Candidate
School of Education
Andrews University

Proposal (Short version)

Since the Bayh-Dole Act (1980), a new entrepreneurial environment is challenging the traditional view and mission of even small to medium sized universities (Slaughter and Leslie, 1997; Powell and Owen-Smith, 1998). Entrepreneurial faculty and university research systems are reshaping communities and businesses through knowledge production with practical applications (Meyer, 2003; Kezar and Eckel, 2000). However, some small and medium doctorate-granting universities seem to struggle to produce knowledge. It is crucial to understand personal and organizational characteristics of successful researchers that can promote or discourage research productivity (Tein, 2000; Siegel, Waldman, Link, 2003).

The purpose of this study is to investigate the influence of the organizational environment and personal characteristics of faculty members on research productivity (FRP) at selected not-for-profit private doctorate-granting universities.

The research questions are:

1. To what extent do different personal variables like demographic characteristics and career-achieved experience relate to faculty research productivity?
2. To what extent do (a) environmental conditions, (b) environmental responses, (c) social knowledge, (d) self-valuation, (e) social contingencies, and (f) scholarly behavior relate to faculty research productivity?

This investigation uses the theoretical approach created by Blackburn et al. (1991) and Blackburn and Lawrence (1995). However, this study develops new variables to measure the effect of exogenous environmental conditions and social contingencies on FRP. It is intended as a complete testing of the full "Faculty at Work" model.

Following the Carnegie Classification (2005), there are 39 small-medium size private not-for-profit doctorate-granting universities. This study will survey (web-based) all part- and full-time undergraduate and graduate faculty from the 39 universities.

March 4, 2006

Dear Faculty Member:

The web-based questionnaire (at the link below) is part of my dissertation project at Andrews University. It is intended to analyze the interaction among various factors that contribute to faculty publication. Your participation is much appreciated and will help me determine factors that influence research productivity at mid-sized private universities.

The questionnaire is being e-distributed to all part and full time faculty at 39 selected not-for-profit private doctorate-granting universities (Carnegie Classification, 2005). Individual responses will not be shared with anyone. This is a web-based survey; individual respondents will not be identifiable.

References made to responses in the dissertation or subsequent articles will not compromise informant confidentiality. The findings will help create a model that will be of interest to both faculty and administrators.

The survey should take about 20 minutes to complete. Here is the link to the questionnaire:

http://www.zoomerang.com/survey.zgi?p=WEB224XU8QZW5T

Later I will download the data and process it with SPSS.

Thank you for your help with this project.

Sincerely,

Gus Gregorutti
Doctoral Student
Andrews University

P.S. Please read the following Informed Consent Form below

Andrews University

School of Education
Education Administration and Leadership Department

Informed Consent Form

Title: Environmental and Personal Factors Related to Faculty Research Productivity at Small-Medium Private Doctorate-granting Universities

Purpose of Study: I understand that the purpose of this investigation is to discover the influence of the organizational environment and personal characteristics of faculty members on their research productivity at selected not-for-profit private doctorate-granting universities.

Inclusion Criteria: In order to participate, I recognize that I must be an adult of 18 years old (or older) and of sound mind, and must currently be an active faculty at this university.

Risks and Discomforts: I have been informed that there are no physical or emotional risks to my involvement in this study and that anonymity will be preserved at all times. As participant, I will not be known to anyone at this university nor outside the university. Whatever I choose to do, relations with my university will not be affected.

Benefits/Results: I accept that I will receive no remuneration for my participation, but that by participating, I will help the researcher arrive at a better understanding of organizational environment and personal characteristics of faculty members on research productivity at selected not-for-profit private doctorate-granting universities.

Voluntary Participation: I understand that my involvement in this survey is voluntary and that I may withdraw my participation at any time without any pressure, embarrassment, or negative impact on me. I also understand that participation is anonymous and that neither the researcher nor any assistants will be able to identify my responses to me. By clicking on the website and entering the Zoomerang site, you are consenting to participate in the study.

Contact Information: If I have any questions or concerns with regard to my participation in this research project, I understand that I may contact either the researcher, Gus Gregorutti at ggregoru@andrews.edu (Tel: 269-473-2063), or his advisor, Dr. Duane Covrig, professor in Educational Administration and Leadership at covrig@andrews.edu (Tel: 269-471-3475).

Faculty Research Productivity

Questions marked with an asterisk (*) are mandatory.

1

*I have read and agreed with the Informed Consent Form received through email from the researcher.

- Yes (If not, open your email and read it)

FACTORS THAT INFLUENCE SCHOLARLY PUBLICATION AT DOCTORATE-GRANTING UNIVERSITIES

INTRODUCTION AND DIRECTIONS

A. This survey should take approximately 20 minutes to complete. Thank you for your cooperation in contributing to this project.

B. This survey explores several factors that influence scholarly publishing. The answers will be held confidential and will not be shared with anyone outside the survey team.

C. For the purpose of this survey, please use the following definitions:

Teaching: Class preparation, scheduled classroom and laboratory instruction, grading, working with students in your office.

Research: Activity that leads to a publication (an article, report, review, monograph, book, grant proposal).

Scholarship: Professional growth--enhancing your knowledge or skill (reading, exploratory inquiries, computer use).

Service: Work in college/university meetings and committees, community activities, professional association involvements.

D. Several questions deal with your immediate work group. In most situations that will be a department. In others, it could be a division, a center, or the organization. Because of the diverse possibilities, I have used the term "unit" as a generic term for all these organizational levels.

This questionnaire is based on the "Faculty at Work questionnaire produced by Dr. Robert Blackburn and his colleagues at the National Center for Research to Improve Postsecondary Teaching and Learning at The University of Michigan - Ann Arbor, and a modified version of the same survey produced by Dr. Carol Hughes. Permission to use these instruments was granted.

I. Work Environment

2

Below are several statements about the general environment in which you work. For each statement check the number that best corresponds with your level of agreement.

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

a. The most highly rewarded faculty members at my institution are those oriented primarily toward their professional accomplishment (Consider all kinds of rewards, not just salary or rank).

1 2 3 4

b. The secretarial support services for my scholarship help me conduct the kind of inquiry I desire.

1 2 3 4

c. Some units on this campus receive more than a fair share of the central administration's allocation of resources because of scholarly publications.

1 2 3 4

d. I am encouraged by my institution to work for the collective good of my unit.

1 2 3 4

e. Faculty can trust the administration to act in good faith for the betterment of the institution.

1 2 3 4

f. Faculty can trust established faculty groups (e.g. governance committees) to act in good faith for the betterment of the institution.

1 2 3 4

g. The faculty in my unit are more committed to the teaching of their discipline than they are to adding to their discipline's knowledge base.

1 2 3 4

h. The faculty in this institution are more committed to teaching than they are to doing research in their disciplinary domain.

1 2 3 4

i. The faculty in my unit view teaching as an obstacle to publishing in a refereed research journal.

1 2 3 4

j. My unit's colleagues know my specialty well enough to assist and critically review my scholarly work.

1 2 3 4

k. The collegial resources (e.g. persons with whom I can discuss research topics) available at my institution help enrich my research.

1 2 3 4

3

Rate your immediate administrator (e.g. chair/director, division head) on each of the following attributes that can affect your work. Check the number that most closely corresponds to your overall level of satisfaction. Characteristic of your immediate supervisor:

1 Very Unsatisfactory | 2 Somewhat Unsatisfactory | 3 Somewhat Satisfactory | 4 Highly Satisfactory

a. Administrative Skills (e.g. communicates with faculty, students, alumni; reach and carry through on decisions)

1 2 3 4

b. Research Skills (e.g. grant writing, research agenda, scholarship, publishing)

1 2 3 4

c. Professionalism (the integrity with which s/he conducts business; knowledge of and commitment to the institution; dedication to the role of effective administrator)

1 2 3 4

d. Experience (knowledge of faculty life; preparation, formal and informal, as an administrator; educational credentials; ability to fulfill special requirements such as fundraising)

1 2 3 4

e. Personality (those aspects of her or his demeanor that makes it more or less easy to work together)

1 2 3 4

4

Rate your next higher level individual (e.g., dean, academic vice-president/provost) on each of the following attributes that can affect your work. Characteristic of the next higher level administrator:

1 Very Unsatisfactory | 2 Somewhat Unsatisfactory | 3 Somewhat Satisfactory | 4 Highly Satisfactory

a. Administrative Skills (e g. communicates with faculty, students, alumni; reach and carry through on decisions)

1 2 3 4

b. Research Skills (e.g. grant writing, research agenda, scholarship, publishing)

1 2 3 4

c. Professionalism (the integrity with which s/he conducts business; knowledge of and commitment to the institution; dedication to the role of effective administrator)

1 2 3 4

d. Experience (knowledge of faculty life; preparation, formal and informal, as an administrator; educational credentials; ability to fulfill special requirements such as fundraising)

1 2 3 4

e. Personality (those aspects of her or his demeanor that makes it more or less easy to work together)

1 2 3 4

5

*During the current term, how much time are you given to teaching, scholarship/professional growth, research, and service in a typical week? Total must be 100%.

Teaching (classes, labs, advising, etc.) %
Scholarship (reading, exploratory inquiries, computer use) %
Research (funding from outside your institution, journal publication, etc.) %
Service (committees, administrative duties, professional org, civic projects, church activities, etc.) %

6

*Indicate how you believe your institution wants you to allocate your effort. Total must be 100%.

Teaching %
Scholarship %
Research %
Service %

7

*Indicate how you would prefer to distribute your time to these four kinds of activities. Total must be 100%.

Teaching %
Scholarship %
Research %
Service %

8

*Below are several statements about the environmental conditions in which you work. Rate each condition:

1 Poor	2 Fair	3 Good	4 Excellent

a. Instruments and equipment for basic research

1 2 3 4

b. Space and supplies for laboratory research

1 2 3 4

c. Basic computer equipment provided for use in my office or at home

1 2 3 4

d. Internet connection quality and speed

1 2 3 4

e. Classroom equipment

1 2 3 4

f. Classroom space

1 2 3 4

g. Secretarial support

1 2 3 4

9

*How much influence do you think you have on the following:

1 Very Unlikely | 2 Somewhat Unlikely | 3 Somewhat Likely | 4 Very Likely

a. Award a larger than average merit raise

1 2 3 4

b. Promote the individual assuming s/he is less than a full professor

1 2 3 4

c. Assign the person an additional research assistant

1 2 3 4

d. Provide more clerical support

1 2 3 4

e. Reduce the person's teaching load

1 2 3 4

f. Provide some extra dollars for a conference attendance

1 2 3 4

g. Award the person additional equipment

1 2 3 4

h. Arrange a public seminar for the presentation of recent research

1 2 3 4

10

*A faculty member's activities may influence what happens to others as well as to herself or himself. Below are some outcomes that depend to varying degrees on your efforts. Check the number that best corresponds to how much influence you think you have on each of the following.

1	2	3	4
Little or No Influence	*Minor Influence*	*Moderate Influence*	*Considerable Influence*

a. Having something you have written accepted for publication

1 2 3 4

b. The salary increase you will receive next year

1 2 3 4

c. Selection of the next chair of your unit

1 2 3 4

d. Obtaining money for travel to professional association meetings (beyond standard institutional allocations)

1 2 3 4

e. Time to pursue your personal research interests

1 2 3 4

f. Selection of the next faculty member hired in your unit

1 2 3 4

g. Securing resources to maintain ongoing academic programs that you consider important

1 2 3 4

h. Establishing criteria for annual review of faculty members

1 2 3 4

II. Personal Characteristics

11

This section has a set of words or phrases dealing with skills, values, and personal attributes that faculty have used to describe other valued faculty members on their campuses. Rate a "typical" valued faculty member in your department or unit by checking the number indicating the degree to which each word or phrase is characteristic of him/her.

1 Not at all Characteristic 2 Slightly Characteristic 3 Somewhat Characteristic 4 Highly Characteristic

Keeps abreast of developments in the discipline

1 2 3 4

Obtain grants

1 2 3 4

Publishes

1 2 3 4

Responds to requests

1 2 3 4

Know how to work the system

1 2 3 4

Communicates well

1 2 3 4

Is organized

1 2 3 4

Believes in the value of hard work

1 2 3 4

Is highly committed to research

1 2 3 4

Holds high standards

1 2 3 4

Has integrity

1 2 3 4

Respects others

1 2 3 4

Is devoted to the institution

1 2 3 4

Values work over home life

1 2 3 4

Is supportive

1 2 3 4

Is competitive

1 2 3 4

Is ambitious

1 2 3 4

Is understanding

1 2 3 4

Is perseverant

1 2 3 4

Has a sense of humor

1 2 3 4

12

Rate yourself by checking the number that best indicates the degree to which each word or phrase is characteristic of you in your professional life.

1 Not at all Characteristic | 2 Slightly Characteristic | 3 Somewhat Characteristic | 4 Highly Characteristic

Keeps abreast of developments in the discipline

1 2 3 4

Obtain grants

1 2 3 4

Publishes

1 2 3 4

Responds to requests

1 2 3 4

Know how to work the system

1 2 3 4

Communicates well

1 2 3 4

Is organized

1 2 3 4

Believes in the value of hard work

1 2 3 4

Is highly committed to research

1 2 3 4

Holds high standards

1 2 3 4

Has integrity

1 2 3 4

Respects others

1 2 3 4

Is devoted to the institution

1 2 3 4

Values work over home life

1 2 3 4

Is supportive

1 2 3 4

Is competitive

1 2 3 4

Is ambitious

1 2 3 4

Is understanding

1 2 3 4

Is perseverant

1 2 3 4

Has a sense of humor

1 2 3 4

13

*Circumstances outside of work can influence your ability to do and publish research. Check the number that best indicates the degree of impact, if any, each of these social contingencies have had on your work in the past two years.

1	2	3	4
Little or No Influence	Minor Influence	Moderate Influence	Considerable Influence

a. Illness/poor health

1 2 3 4

b. Child care

1 2 3 4

c. Financial crises

1 2 3 4

d. Pregnancy/new child

1 2 3 4

e. Relationship strain with spouse or significant other

1 2 3 4

f. Unusually heavy domestic/family responsibilities

1 2 3 4

g. Death of a close family member

1 2 3 4

14

*For the following questions please give your best estimate of how often you have done the following during the past two years.

1	2	3	4	
Once	Twice	3-5 Times	6+ Times	None

a. Submitted a scholarly article for publication

1 2 3 4 ___

b. Used e-mail to discuss your research with colleagues

1 2 3 4 ___

c. Presented your ongoing work on campus or at a professional meeting

1 2 3 4 ___

d. Submitted a research proposal to a governmental or private agency

1 2 3 4 ___

e. Written a research report for a granting agency, institution or other group

1 2 3 4 ___

f. Reviewed articles for a professional journal

1 2 3 4 ___

g. Had informal conversations about research with colleagues at professional meetings

1 2 3 4 ___

h. Had telephone conversations with colleagues to discuss your scholarly activities

1 2 3 4 ___

i. Submitted a proposal for a conference presentation

1 2 3 4 ___

j. Submitted a proposal for a scholarly monograph to a publisher

1 2 3 4 ___

III. Background (Last section)

15

*In what (kind of unit) (e.g. History, English) is your principal appointment?

- Humanistic/ Fine Arts
- Sciences/Applied Sciences
- Social Sciences

16

*What is your area of specialization (e.g., sociology, chemistry)?

17

*What is your University? (This is only to identify the type of university)

18

*How many years have you been at this institution (including this year)?

19

*Check the highest degree you have earned:

20

*How many years ago did you get your highest degree?

21

Your age

22

*What type of appointment do you now hold?

- Regular with tenure
- Regular without tenure
- Yearly term appointment
- Visiting

23

*What is your gender?

- Female
- Male

24

*The racial or ethnic group with which you identify yourself is:

- American Indian/Alaskan Native
- Asian/Pacific Islander
- Black/Non-Hispanic origin
- Hispanic
- White/Non-Hispanic origin

25

*In the past two years have you begun a substantially new line of investigation in your research?

- Yes
- No

26

*Are you currently appointed to an administrative position?

- Yes
- No

27

*Your current academic rank is:

Asst. Professor	Assoc. Professor	Professor	Other
1	2	3	4

28

*You are teaching at:

Undergraduate Level	Graduate Level	Both Levels
1	2	3

For the Following Questions Please Give Your Best Estimate:

29

*How many hours of student research assistance do you have per week?

30

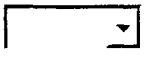
*How many thesis or dissertation committees have you chaired in the last two years?

31

*How many thesis or dissertation committees have you served on in the last two years? (Exclude those that you chaired.)

32

*On how many journal editorial boards have you served in the last two years?



33

*For how many journals have you reviewed articles in the last two years?

34

*Approximately how many articles have you had published in the last two years?

35

*Approximately how many books have you authored or co-authored in the scholarly press in the last two years?

36

*Approximately how many chapters in books or conference proceedings have you had published in the last two years?

37

*Approximately how many books have you edited for the scholarly press in the last two years?

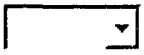
Please Answer the Following Questions in Terms of Your Entire Career as a Faculty Member (Use numbers).

38

*Over your career, about how many refereed articles have you published in academic or professional journals?

39

*Over your career, how many books or monographs have you published or edited, alone or in collaboration?



40

*Over your career, how many chapters in books or conference proceedings have you published?

41

*Over your career, how many external research grants have you been awarded by an institutional, federal or private agency as either a principal investigator or co-investigator?

42

Would you be willing to be contacted for follow up questions? If yes, write your email address below.

SUBMIT

Faculty Research Productivity Follow Up

Factors Affecting Scholarly Publication

Thank you for participating in my online survey on faculty productivity and for volunteering to make additional comments. Below are some short open ended questions to facilitate your comments but please feel free to share anything related to faculty research productivity you would like to mention.

Your Opinion

1

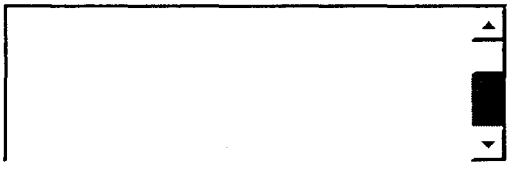
What reasons do you have to publish (better teaching, knowledge advancement, resources, etc)? Number them.

2

Do you consider yourself a successful researcher (journals, books, conferences, expositions, etc.)? Why yes or no?

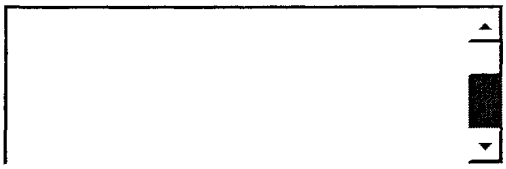
3

What would help you be a productive researcher?



4

What institutional/departmental characteristics would help you to produce more research?

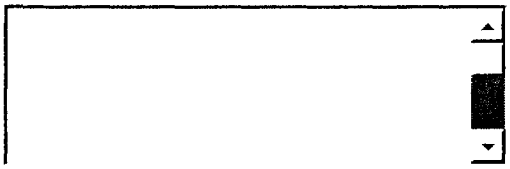


5

Do you think that your department promotes and mentors faculty research productivity? Why yes or no?

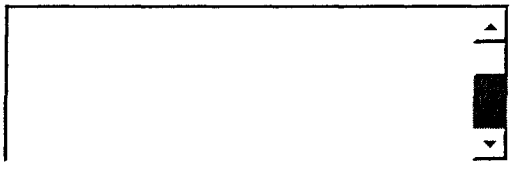
6

Do you think your institution should refocus toward more research? Why yes or no?



7

Are there any other comments on these issues you would like to make?



Background Information

8

In what (kind of unit) (e.g. History, English) is your principal appointment?

- Humanistic/Fine Arts
- Sciences/Applied Sciences
- Social Sciences

9

What is your gender?

- Female
- Male

10

Are you currently appointed to an administrative position?

- Yes
- No

11

Your current academic rank is:

Ass. Professor	Asoc. Professor	Professor	Other
1	2	3	4

12

You are teaching at:

Undergraduate Level	Graduate Level	Both Levels
1	2	3

SUBMIT

APPENDIX B

REGRESSION ANALYSIS

All variables predicting q .cles, last 2 years)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.266(a)	.071	.061	2.433	.071	6.827	.000
2	.311(b)	.097	.083	2.403	.026	7.662	.006
3	.390(c)	.152	.120	2.355	.055	2.843	.011
4	.607(d)	.369	.327	2.060	.217	12.460	.000
5	.608(e)	.369	.324	2.064	.000	.030	.863
6	.708(f)	.501	.457	1.849	.132	16.515	.000

a. Predictors: (Constant), Index, Univteacheq, resequip
b. Predictors: (Constant), Index, Univteacheq, resequip, envrespo
c. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust
d. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother
e. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl
f. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl, Dissinvol, Grantres, Resinter, resinvol

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121.223	3	40.408	6.827	.000(a)
	Residual	1586.244	268	5.919		
	Total	1707.467	271			
2	Regression	165.471	4	41.368	7.163	.000(b)
	Residual	1541.996	267	5.775		
	Total	1707.467	271			
3	Regression	260.074	10	26.007	4.690	.000(c)
	Residual	1447.393	261	5.546		
	Total	1707.467	271			
4	Regression	630.039	17	37.061	8.737	.000(d)
	Residual	1077.428	254	4.242		
	Total	1707.467	271			
5	Regression	630.166	18	35.009	8.222	.000(e)
	Residual	1077.301	253	4.258		
	Total	1707.467	271			
6	Regression	856.052	22	38.911	11.380	.000(f)
	Residual	851.415	249	3.419		
	Total	1707.467	271			

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.917	.742		2.586	.010
	resequip	.023	.249	.006	.094	.925
	Univteacheq	-.386	.214	-.118	-1.807	.072
	Index	2.216	.563	.233	3.933	.000
	envrespo					
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
2	(Constant)	1.253	.771		1.626	.105
	resequip	-.076	.248	-.020	-.306	.760
	Univteacheq	-.504	.215	-.154	-2.343	.020
	Index	2.135	.557	.225	3.831	.000
	envrespo	.689	.249	.170	2.768	.006
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					

	Grantres					
	Dissinvol					
	resinvol					
3	(Constant)	4.742	1.282		3.698	.000
	resequip	.082	.250	.021	.328	.743
	Univteacheq	-.460	.219	-.140	-2.099	.037
	Index	1.339	.596	.141	2.245	.026
	envrespo	.597	.280	.147	2.132	.034
	Trustcolsp	-.337	.203	-.105	-1.663	.097
	Envtrust	-.406	.284	-.103	-1.427	.155
	Teachcommit	-.660	.222	-.184	-2.976	.003
	immedadm	-.081	.230	-.024	-.351	.726
	nextladm	.000	.225	.000	.002	.998
	profinfl	.263	.266	.070	.989	.323
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
4	(Constant)	2.300	1.935		1.189	.236
	resequip	.097	.225	.026	.433	.665
	Univteacheq	-.551	.193	-.168	-2.850	.005
	Index	.024	.566	.003	.043	.966
	envrespo	.398	.251	.098	1.584	.114
	Trustcolsp	-.276	.187	-.086	-1.481	.140
	Envtrust	-.296	.255	-.075	-1.158	.248
	Teachcommit	-.273	.208	-.076	-1.311	.191
	immedadm	-.096	.207	-.028	-.463	.644
	nextladm	.131	.200	.039	.655	.513
	profinfl	.042	.234	.011	.179	.858
	Traitother	.205	.316	.042	.649	.517
	Rescommit	.367	.180	.127	2.038	.043
	Wkvalother	-.131	.199	-.039	-.658	.511
	Personstd	-.667	.455	-.089	-1.467	.144
	Traitsme	-.234	.380	-.037	-.616	.538
	Rescomme	1.315	.169	.458	7.762	.000
	Wkvalume	.124	.201	.039	.615	.539
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
5	(Constant)	2.365	1.975		1.198	.232
	resequip	.094	.226	.025	.415	.679
	Univteacheq	-.549	.194	-.168	-2.826	.005
	Index	.029	.568	.003	.052	.959

	envrespo	.395	.252	.097	1.564	.119
	Trustcolsp	-.278	.187	-.086	-1.486	.138
	Envtrust	-.293	.256	-.074	-1.142	.255
	Teachcommit	-.270	.209	-.076	-1.292	.197
	immedadm	-.096	.207	-.028	-.464	.643
	nextladm	.130	.200	.039	.651	.516
	profinfl	.042	.235	.011	.179	.858
	Traitother	.203	.317	.042	.640	.523
	Rescommit	.365	.180	.126	2.024	.044
	Wkvalother	-.129	.199	-.038	-.648	.518
	Personstd	-.672	.456	-.090	-1.472	.142
	Traitsme	-.232	.381	-.037	-.609	.543
	Rescomme	1.314	.170	.458	7.742	.000
	Wkvalume	.127	.202	.040	.627	.531
	famprobl	-.034	.195	-.009	-.173	.863
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
6	(Constant)	-.181	1.832		-.099	.921
	resequip	.117	.204	.031	.575	.566
	Univteacheq	-.303	.178	-.093	-1.706	.089
	Index	-.396	.514	-.042	-.770	.442
	envrespo	.304	.228	.075	1.331	.184
	Trustcolsp	-.185	.171	-.057	-1.081	.281
	Envtrust	-.308	.232	-.078	-1.330	.185
	Teachcommit	-.157	.190	-.044	-.824	.410
	immedadm	.165	.190	.048	.870	.385
	nextladm	.164	.182	.049	.903	.367
	profinfl	-.269	.215	-.072	-1.250	.212
	Traitother	.192	.286	.039	.671	.503
	Rescommit	.279	.164	.096	1.702	.090
	Wkvalother	-.218	.182	-.065	-1.200	.231
	Personstd	-.265	.415	-.035	-.637	.524
	Traitsme	-.207	.343	-.033	-.603	.547
	Rescomme	.606	.188	.211	3.214	.001
	Wkvalume	.242	.183	.076	1.326	.186
	famprobl	.009	.177	.002	.050	.960
	Resinter	.310	.172	.117	1.803	.073
	Grantres	.080	.207	.028	.384	.701
	Dissinvol	.149	.156	.048	.951	.343
	resinvol	.880	.167	.381	5.257	.000

a. Dependent Variable: Q34 articles last two years

All variables predicting q35 (books authored or co-authored, last 2 years)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.121(a)	.015	.004	.565	.015	1.320	.268
2	.127(b)	.016	.001	.566	.002	.417	.519
3	.207(c)	.043	.006	.565	.027	1.208	.302
4	.413(d)	.171	.115	.533	.128	5.608	.000
5	.417(e)	.174	.115	.533	.003	.962	.328
6	.432(f)	.186	.114	.533	.012	.949	.436

a. Predictors: (Constant), Index, Univteacheq, resequip
b. Predictors: (Constant), Index, Univteacheq, resequip, envrespo
c. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust
d. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother
e. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl
f. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl, Dissinvol, Grantres, Resinter, resinvol

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.266	3	.422	1.320	.268(a)
	Residual	85.675	268	.320		
	Total	86.941	271			
2	Regression	1.399	4	.350	1.092	.361(b)
	Residual	85.542	267	.320		
	Total	86.941	271			
3	Regression	3.711	10	.371	1.164	.316(c)
	Residual	83.230	261	.319		
	Total	86.941	271			
4	Regression	14.853	17	.874	3.078	.000(d)
	Residual	72.089	254	.284		
	Total	86.941	271			
5	Regression	15.126	18	.840	2.960	.000(e)
	Residual	71.816	253	.284		
	Total	86.941	271			
6	Regression	16.204	22	.737	2.593	.000(f)
	Residual	70.737	249	.284		

	Total	86.941	271

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.024	.172		-.142	.887
	resequip	.080	.058	.093	1.384	.167
	Univteacheq	-.018	.050	-.025	-.371	.711
	Index	.167	.131	.078	1.276	.203
	envrespo					
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
2	(Constant)	-.061	.182		-.336	.737
	resequip	.075	.059	.087	1.275	.203
	Univteacheq	-.025	.051	-.034	-.491	.624
	Index	.163	.131	.076	1.239	.216
	envrespo	.038	.059	.041	.646	.519
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					

	Grantres					
	Dissinvol					
	resinvol					
3	(Constant)	.251	.307		.816	.415
	resequip	.093	.060	.108	1.553	.122
	Univteacheq	-.005	.053	-.006	-.091	.928
	Index	.072	.143	.033	.500	.617
	envrespo	.053	.067	.057	.785	.433
	Trustcolsp	.063	.049	.087	1.298	.195
	Envtrust	-.062	.068	-.070	-.916	.361
	Teachcommit	-.024	.053	-.030	-.450	.653
	immedadm	.005	.055	.007	.094	.925
	nextladm	-.103	.054	-.136	-1.898	.059
	profinfl	-.006	.064	-.007	-.096	.924
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
4	(Constant)	.020	.501		.039	.969
	resequip	.142	.058	.165	2.435	.016
	Univteacheq	-.028	.050	-.038	-.554	.580
	Index	-.086	.146	-.040	-.588	.557
	envrespo	.006	.065	.007	.095	.924
	Trustcolsp	.072	.048	.099	1.500	.135
	Envtrust	-.059	.066	-.066	-.897	.371
	Teachcommit	-.008	.054	-.010	-.143	.887
	immedadm	.003	.054	.003	.048	.962
	nextladm	-.075	.052	-.099	-1.455	.147
	profinfl	-.035	.061	-.042	-.581	.562
	Traitother	.086	.082	.079	1.054	.293
	Rescommit	-.059	.047	-.090	-1.259	.209
	Wkvalother	.001	.051	.001	.012	.990
	Personstd	-.256	.118	-.152	-2.175	.031
	Traitsme	.022	.098	.016	.226	.821
	Rescomme	.179	.044	.277	4.094	.000
	Wkvalume	.155	.052	.216	2.988	.003
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
5	(Constant)	.114	.510		.224	.823
	resequip	.136	.058	.158	2.335	.020
	Univteacheq	-.024	.050	-.033	-.485	.628
	Index	-.079	.147	-.037	-.540	.590

	envrespo	.002	.065	.002	.025	.980
	Trustcolsp	.070	.048	.096	1.441	.151
	Envtrust	-.055	.066	-.062	-.831	.407
	Teachcommit	-.004	.054	-.005	-.070	.944
	immedadm	.002	.054	.003	.037	.971
	nextladm	-.076	.052	-.100	-1.471	.143
	profinfl	-.035	.061	-.042	-.580	.563
	Traitother	.083	.082	.076	1.013	.312
	Rescommit	-.061	.047	-.093	-1.302	.194
	Wkvalother	.003	.051	.004	.061	.951
	Personstd	-.263	.118	-.156	-2.233	.026
	Traitsme	.026	.098	.018	.262	.794
	Rescomme	.178	.044	.276	4.071	.000
	Wkvalume	.160	.052	.222	3.066	.002
	famprobl	-.049	.050	-.058	-.981	.328
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
6	(Constant)	.237	.528		.449	.654
	resequip	.140	.059	.162	2.374	.018
	Univteacheq	-.037	.051	-.050	-.725	.469
	Index	-.087	.148	-.040	-.584	.560
	envrespo	.003	.066	.003	.047	.963
	Trustcolsp	.078	.049	.107	1.572	.117
	Envtrust	-.059	.067	-.066	-.886	.377
	Teachcommit	-.018	.055	-.022	-.332	.740
	immedadm	-.002	.055	-.002	-.031	.975
	nextladm	-.092	.052	-.122	-1.756	.080
	profinfl	-.022	.062	-.026	-.356	.722
	Traitother	.096	.082	.088	1.171	.243
	Rescommit	-.053	.047	-.082	-1.130	.259
	Wkvalother	-.004	.052	-.005	-.078	.938
	Personstd	-.258	.120	-.153	-2.152	.032
	Traitsme	.026	.099	.018	.264	.792
	Rescomme	.215	.054	.333	3.966	.000
	Wkvalume	.149	.053	.207	2.833	.005
	famprobl	-.057	.051	-.066	-1.109	.269
	Resinter	-.065	.050	-.109	-1.319	.188
	Grantres	.074	.060	.113	1.237	.217
	Dissinvol	-.045	.045	-.064	-1.000	.318
	resinvol	-.038	.048	-.073	-.791	.430

a. Dependent Variable: Q35 books authored or co-authored last two years

All variables predicting q36 (conference proceedings, last 2 years)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.165(a)	.027	.016	1.717	.027	2.499	.060
2	.165(b)	.027	.013	1.720	.000	.025	.876
3	.226(c)	.051	.015	1.718	.024	1.090	.369
4	.417(d)	.174	.119	1.625	.123	5.397	.000
5	.437(e)	.191	.133	1.611	.017	5.248	.023
6	.487(f)	.237	.170	1.577	.047	3.804	.005

a. Predictors: (Constant), Index, Univteacheq, resequip
b. Predictors: (Constant), Index, Univteacheq, resequip, envrespo
c. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust
d. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother
e. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl
f. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl, Dissinvol, Grantres, Resinter, resinvol

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.094	3	7.365	2.499	.060(a)
	Residual	789.774	268	2.947		
	Total	811.868	271			
2	Regression	22.166	4	5.542	1.874	.115(b)
	Residual	789.701	267	2.958		
	Total	811.868	271			
3	Regression	41.466	10	4.147	1.405	.178(c)
	Residual	770.401	261	2.952		
	Total	811.868	271			
4	Regression	141.222	17	8.307	3.146	.000(d)
	Residual	670.646	254	2.640		
	Total	811.868	271			
5	Regression	154.851	18	8.603	3.313	.000(e)
	Residual	657.017	253	2.597		
	Total	811.868	271			
6	Regression	192.692	22	8.759	3.522	.000(f)
	Residual	619.176	249	2.487		
	Total	811.868	271			

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.267	.523		2.421	.016
	resequip	-.096	.176	-.036	-.545	.586
	Univteacheq	-.142	.151	-.063	-.940	.348
	Index	.919	.398	.140	2.313	.021
	envrespo					
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
2	(Constant)	1.293	.552		2.345	.020
	resequip	-.092	.178	-.035	-.516	.606
	Univteacheq	-.137	.154	-.061	-.888	.375
	Index	.923	.399	.141	2.314	.021
	envrespo	-.028	.178	-.010	-.157	.876
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					

	resinvol					
3	(Constant)	2.361	.935		2.524	.012
	resequip	-.078	.182	-.030	-.428	.669
	Univteacheq	-.170	.160	-.075	-1.065	.288
	Index	.648	.435	.099	1.490	.138
	envrespo	-.152	.204	-.054	-.744	.458
	Trustcolsp	.086	.148	.039	.580	.563
	Envtrust	.031	.207	.012	.152	.880
	Teachcommit	-.304	.162	-.123	-1.882	.061
	immedadm	-.019	.168	-.008	-.114	.909
	nextladm	-.167	.164	-.072	-1.012	.312
	profinfl	.214	.194	.083	1.104	.271
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
4	(Constant)	1.709	1.527		1.120	.264
	resequip	-.026	.177	-.010	-.145	.885
	Univteacheq	-.259	.153	-.115	-1.695	.091
	Index	.020	.447	.003	.044	.965
	envrespo	-.232	.198	-.083	-1.169	.243
	Trustcolsp	.083	.147	.037	.561	.575
	Envtrust	.022	.201	.008	.108	.914
	Teachcommit	-.189	.164	-.076	-1.147	.252
	immedadm	-.096	.163	-.041	-.590	.556
	nextladm	-.101	.157	-.044	-.645	.520
	profinfl	.135	.185	.052	.729	.467
	Traitother	.476	.250	.142	1.908	.058
	Rescommit	-.017	.142	-.008	-.118	.906
	Wkvalother	.275	.157	.119	1.754	.081
	Personstd	-.984	.359	-.191	-2.742	.007
	Traitsme	.059	.300	.014	.198	.844
	Rescomme	.565	.134	.285	4.226	.000
	Wkvalume	.211	.159	.096	1.329	.185
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
5	(Constant)	2.377	1.542		1.541	.124
	resequip	-.063	.177	-.024	-.355	.723
	Univteacheq	-.235	.152	-.104	-1.546	.123
	Index	.069	.443	.011	.156	.876
	envrespo	-.264	.197	-.094	-1.340	.182
	Trustcolsp	.063	.146	.028	.432	.666

	Envtrust	.052	.200	.019	.257	.797
	Teachcommit	-.161	.163	-.065	-.986	.325
	immedadm	-.100	.162	-.043	-.621	.535
	nextladm	-.107	.156	-.046	-.687	.493
	profinfl	.135	.183	.052	.739	.461
	Traitother	.453	.248	.135	1.829	.069
	Rescommit	-.031	.141	-.016	-.223	.824
	Wkvalother	.293	.156	.127	1.881	.061
	Personstd	-1.035	.356	-.201	-2.905	.004
	Traitsme	.084	.298	.019	.282	.778
	Rescomme	.558	.133	.282	4.211	.000
	Wkvalume	.244	.158	.111	1.548	.123
	famprobl	-.349	.152	-.134	-2.291	.023
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
6	(Constant)	1.616	1.563		1.034	.302
	resequip	-.079	.174	-.030	-.454	.650
	Univteacheq	-.126	.152	-.056	-.830	.407
	Index	-.076	.439	-.012	-.172	.863
	envrespo	-.272	.195	-.097	-1.397	.164
	Trustcolsp	.098	.146	.044	.671	.503
	Envtrust	.079	.198	.029	.400	.689
	Teachcommit	-.113	.162	-.046	-.696	.487
	immedadm	-.017	.162	-.007	-.104	.917
	nextladm	-.094	.155	-.041	-.606	.545
	profinfl	-.002	.183	-.001	-.008	.993
	Traitother	.444	.244	.132	1.821	.070
	Rescommit	-.050	.140	-.025	-.356	.722
	Wkvalother	.237	.155	.102	1.531	.127
	Personstd	-.912	.354	-.177	-2.576	.011
	Traitsme	.059	.292	.014	.202	.840
	Rescomme	.319	.161	.161	1.984	.048
	Wkvalume	.294	.156	.134	1.887	.060
	famprobl	-.342	.151	-.131	-2.269	.024
	Resinter	.055	.147	.030	.376	.707
	Grantres	.175	.176	.088	.990	.323
	Dissinvol	.193	.133	.090	1.445	.150
	resinvol	.222	.143	.139	1.555	.121

a. Dependent Variable: Q36 chapters in books or conference proceedings last two years

All variables predicting q37 (Books edited, last 2 years)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.092(a)	.008	-.003	.743	.008	.764	.515
2	.092(b)	.009	-.006	.745	.000	.008	.928
3	.224(c)	.050	.014	.737	.042	1.914	.079
4	.268(d)	.072	.010	.739	.022	.844	.552
5	.268(e)	.072	.006	.740	.000	.004	.951
6	.326(f)	.106	.027	.732	.034	2.376	.053

a. Predictors: (Constant), Index, Univteacheq, resequip
b. Predictors: (Constant), Index, Univteacheq, resequip, envrespo
c. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust
d. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother
e. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl
f. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl, Dissinvol, Grantres, Resinter, resinvol

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.267	3	.422	.764	.515(a)
	Residual	148.141	268	.553		
	Total	149.408	271			
2	Regression	1.272	4	.318	.573	.682(b)
	Residual	148.137	267	.555		
	Total	149.408	271			
3	Regression	7.513	10	.751	1.382	.189(c)
	Residual	141.895	261	.544		
	Total	149.408	271			
4	Regression	10.737	17	.632	1.157	.301(d)
	Residual	138.671	254	.546		
	Total	149.408	271			
5	Regression	10.739	18	.597	1.089	.364(e)
	Residual	138.669	253	.548		
	Total	149.408	271			
6	Regression	15.838	22	.720	1.342	.145(f)
	Residual	133.570	249	.536		
	Total	149.408	271			

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.083	.227		.366	.715
	resequip	.024	.076	.021	.310	.756
	Univteacheq	.010	.065	.011	.158	.874
	Index	.245	.172	.087	1.425	.155
	envrespo					
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
2	(Constant)	.090	.239		.375	.708
	resequip	.025	.077	.022	.320	.749
	Univteacheq	.012	.067	.012	.173	.863
	Index	.246	.173	.088	1.425	.155
	envrespo	-.007	.077	-.006	-.091	.928
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					

	resinvol					
3	(Constant)	.743	.401		1.850	.065
	resequip	.062	.078	.055	.797	.426
	Univteacheq	.049	.069	.050	.712	.477
	Index	.079	.187	.028	.422	.674
	envrespo	.059	.088	.049	.675	.501
	Trustcolsp	.079	.064	.083	1.240	.216
	Envtrust	-.040	.089	-.034	-.446	.656
	Teachcommit	-.050	.069	-.047	-.721	.471
	immedadm	-.037	.072	-.037	-.516	.607
	nextladm	-.174	.071	-.175	-2.459	.015
	profinfl	-.081	.083	-.073	-.978	.329
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
4	(Constant)	-.097	.694		-.140	.889
	resequip	.074	.081	.065	.916	.361
	Univteacheq	.049	.069	.050	.703	.483
	Index	.062	.203	.022	.306	.760
	envrespo	.048	.090	.040	.536	.593
	Trustcolsp	.055	.067	.058	.829	.408
	Envtrust	-.036	.092	-.031	-.396	.692
	Teachcommit	-.045	.075	-.042	-.597	.551
	immedadm	-.038	.074	-.038	-.514	.608
	nextladm	-.168	.072	-.170	-2.349	.020
	profinfl	-.098	.084	-.088	-1.166	.245
	Traitother	.039	.113	.027	.347	.729
	Rescommit	.006	.065	.007	.095	.924
	Wkvalother	-.035	.071	-.035	-.493	.622
	Personstd	-.026	.163	-.012	-.159	.874
	Traitsme	.144	.136	.077	1.053	.294
	Rescomme	.064	.061	.075	1.048	.296
	Wkvalume	.085	.072	.090	1.182	.238
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
5	(Constant)	-.105	.708		-.149	.882
	resequip	.074	.081	.066	.916	.361
	Univteacheq	.048	.070	.050	.695	.487
	Index	.061	.204	.022	.302	.763
	envrespo	.049	.091	.040	.538	.591
	Trustcolsp	.056	.067	.058	.829	.408

	Envtrust	-.037	.092	-.031	-.399	.691
	Teachcommit	-.045	.075	-.042	-.599	.550
	immedadm	-.038	.074	-.038	-.512	.609
	nextladm	-.168	.072	-.170	-2.343	.020
	profinfl	-.098	.084	-.088	-1.164	.246
	Traitother	.040	.114	.028	.349	.728
	Rescommit	.006	.065	.007	.098	.922
	Wkvalother	-.035	.072	-.036	-.494	.621
	Personstd	-.025	.164	-.011	-.155	.877
	Traitsme	.143	.137	.077	1.048	.296
	Rescomme	.064	.061	.075	1.047	.296
	Wkvalume	.085	.073	.090	1.169	.244
	famprobl	.004	.070	.004	.061	.951
	Resinter					
	Grantres					
	Dissinvol					
	resinvol					
6	(Constant)	-.015	.726		-.021	.983
	resequip	.073	.081	.065	.901	.369
	Univteacheq	.062	.070	.064	.880	.380
	Index	.014	.204	.005	.069	.945
	envrespo	.059	.090	.049	.650	.517
	Trustcolsp	.088	.068	.092	1.297	.196
	Envtrust	-.031	.092	-.026	-.334	.738
	Teachcommit	-.057	.075	-.054	-.757	.450
	immedadm	-.025	.075	-.025	-.334	.739
	nextladm	-.189	.072	-.191	-2.624	.009
	profinfl	-.129	.085	-.116	-1.515	.131
	Traitother	.052	.113	.036	.462	.644
	Rescommit	.006	.065	.007	.090	.928
	Wkvalother	-.061	.072	-.062	-.854	.394
	Personstd	.014	.164	.006	.085	.932
	Traitsme	.131	.136	.070	.965	.336
	Rescomme	.071	.075	.084	.957	.340
	Wkvalume	.080	.072	.085	1.111	.268
	famprobl	-.015	.070	-.013	-.209	.835
	Resinter	-.140	.068	-.178	-2.048	.042
	Grantres	.159	.082	.187	1.946	.053
	Dissinvol	.024	.062	.026	.387	.699
	resinvol	.029	.066	.043	.442	.659

a. Dependent Variable: Q37 books edited last two years

All variables predicting q38 (Career articles productivity)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.339(a)	.115	.105	1.640	.115	11.591	.000
2	.377(b)	.142	.130	1.617	.028	8.590	.004
3	.449(c)	.201	.171	1.578	.059	3.217	.005
4	.604(d)	.365	.322	1.427	.163	9.331	.000
5	.604(e)	.365	.320	1.429	.000	.038	.845
6	.784(f)	.614	.580	1.123	.249	40.187	.000

a. Predictors: (Constant), Index, Univteacheq, resequip
b. Predictors: (Constant), Index, Univteacheq, resequip, envrespo
c. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust
d. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother
e. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl
f. Predictors: (Constant), Index, Univteacheq, resequip, envrespo, Trustcolsp, Teachcommit, nextladm, immedadm, profinfl, Envtrust, Wkvalother, Personstd, Rescomme, Traitsme, Rescommit, Wkvalume, Traitother, famprobl, Dissinvol, Grantres, Resinter, resinvol2

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	93.491	3	31.164	11.591	.000(a)
	Residual	720.564	268	2.689		
	Total	814.055	271			
2	Regression	115.951	4	28.988	11.087	.000(b)
	Residual	698.104	267	2.615		
	Total	814.055	271			
3	Regression	164.018	10	16.402	6.586	.000(c)
	Residual	650.037	261	2.491		
	Total	814.055	271			
4	Regression	296.980	17	17.469	8.581	.000(d)
	Residual	517.075	254	2.036		
	Total	814.055	271			
5	Regression	297.058	18	16.503	8.076	.000(e)
	Residual	516.997	253	2.043		
	Total	814.055	271			
6	Regression	499.881	22	22.722	18.008	.000(f)
	Residual	314.175	249	1.262		
	Total	814.055	271			

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.280	.500		2.562	.011
	resequip	.094	.168	.036	.561	.575
	Univteacheq	-.257	.144	-.114	-1.787	.075
	Index	2.060	.380	.314	5.424	.000
	envrespo					
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol2					
2	(Constant)	.807	.519		1.556	.121
	resequip	.023	.167	.009	.139	.890
	Univteacheq	-.342	.145	-.151	-2.359	.019
	Index	2.002	.375	.305	5.340	.000
	envrespo	.491	.168	.175	2.931	.004
	Trustcolsp					
	Envtrust					
	Teachcommit					
	immedadm					
	nextladm					
	profinfl					
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					

	resinvol2					
3	(Constant)	2.607	.859		3.034	.003
	resequip	.125	.167	.047	.746	.456
	Univteacheq	-.300	.147	-.133	-2.043	.042
	Index	1.618	.400	.246	4.047	.000
	envrespo	.350	.188	.125	1.864	.063
	Trustcolsp	-.342	.136	-.154	-2.515	.013
	Envtrust	-.240	.191	-.088	-1.259	.209
	Teachcommit	-.258	.149	-.104	-1.735	.084
	immedadm	-.053	.154	-.023	-.345	.730
	nextladm	-.098	.151	-.042	-.649	.517
	profinfl	.407	.178	.157	2.281	.023
	Traitother					
	Rescommit					
	Wkvalother					
	Personstd					
	Traitsme					
	Rescomme					
	Wkvalume					
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol2					
4	(Constant)	1.424	1.341		1.062	.289
	resequip	.123	.156	.047	.789	.431
	Univteacheq	-.357	.134	-.158	-2.667	.008
	Index	.826	.392	.126	2.105	.036
	envrespo	.230	.174	.082	1.322	.187
	Trustcolsp	-.261	.129	-.117	-2.018	.045
	Envtrust	-.172	.177	-.063	-.974	.331
	Teachcommit	-.042	.144	-.017	-.290	.772
	immedadm	-.051	.143	-.022	-.357	.721
	nextladm	-.007	.138	-.003	-.048	.962
	profinfl	.283	.162	.109	1.743	.083
	Traitother	.002	.219	.001	.010	.992
	Rescommit	.123	.125	.061	.987	.325
	Wkvalother	.024	.138	.010	.174	.862
	Personstd	-.310	.315	-.060	-.985	.326
	Traitsme	-.158	.263	-.036	-.600	.549
	Rescomme	.864	.117	.436	7.365	.000
	Wkvalume	-.101	.139	-.046	-.722	.471
	famprobl					
	Resinter					
	Grantres					
	Dissinvol					
	resinvol2					
5	(Constant)	1.474	1.368		1.078	.282
	resequip	.120	.157	.046	.766	.444
	Univteacheq	-.356	.135	-.157	-2.642	.009
	Index	.829	.393	.126	2.108	.036
	envrespo	.228	.175	.081	1.302	.194
	Trustcolsp	-.262	.130	-.118	-2.022	.044

	Envtrust	-.170	.178	-.062	-.957	.339
	Teachcommit	-.040	.145	-.016	-.275	.784
	immedadm	-.052	.144	-.022	-.359	.720
	nextladm	-.007	.138	-.003	-.051	.960
	profinfl	.283	.163	.109	1.740	.083
	Traitother	.000	.220	.000	.002	.998
	Rescommit	.122	.125	.061	.975	.331
	Wkvalother	.025	.138	.011	.184	.854
	Personstd	-.314	.316	-.061	-.993	.322
	Traitsme	-.156	.264	-.036	-.591	.555
	Rescomme	.864	.118	.436	7.345	.000
	Wkvalume	-.098	.140	-.045	-.700	.485
	famprobl	-.026	.135	-.010	-.196	.845
	Resinter					
	Grantres					
	Dissinvol					
	resinvol2					
6	(Constant)	.133	1.116		.119	.905
	resequip	.183	.125	.069	1.467	.144
	Univteacheq	-.162	.108	-.072	-1.503	.134
	Index	.484	.312	.074	1.549	.123
	envrespo	.241	.139	.086	1.740	.083
	Trustcolsp	-.151	.103	-.068	-1.462	.145
	Envtrust	-.216	.142	-.079	-1.524	.129
	Teachcommit	.002	.115	.001	.016	.988
	immedadm	.178	.116	.075	1.528	.128
	nextladm	-.023	.110	-.010	-.212	.832
	profinfl	-.018	.131	-.007	-.137	.891
	Traitother	.010	.174	.003	.057	.955
	Rescommit	.075	.099	.038	.758	.449
	Wkvalother	-.126	.110	-.055	-1.148	.252
	Personstd	.019	.252	.004	.077	.939
	Traitsme	-.168	.208	-.038	-.804	.422
	Rescomme	.516	.113	.260	4.549	.000
	Wkvalume	-.009	.111	-.004	-.077	.939
	famprobl	-.068	.107	-.026	-.634	.527
	Resinter	-.330	.105	-.180	-3.148	.002
	Grantres	.400	.121	.201	3.294	.001
	Dissinvol	.304	.094	.142	3.221	.001
	resinvol2	.873	.118	.445	7.398	.000

a. Dependent Variable: Question 38: Over your career, about how many refereed articles have you published in academic or professional journals?

REFERENCE LIST

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Experience

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Fund raiser, working from USA.

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Teaching and research assisting in the School of Education.

2002-2003 Recruiting Assistant for Spanish and Portuguese Speaking in the USA.

K-12 Education

1997-1999 La Paloma Adventist Academy, Paraguay.
Principal and teacher of social sciences.

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Professional Affiliations

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Recent Publications

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"Book Review: Newman, Frank, Couturier, Lara, and Scurry, Jamie. (2004). The Future of Higher Education: Rhetoric, Reality, and the Risks of the Market." San Francisco, CA: Jossey-Bass. *The Journal of Higher Education*, July/August, Volumen 78/Number 4, 2007

Recent Paper Presentations

"Trends Influencing Enrollment in Adventist Parochial K-12 Schools in North America: A Review of the Literature." Paper presented at the 1st Annual Educational Leadership Research Symposium, Eastern Michigan University, October 2007

"Faculty Research Productivity." Paper presented at the AERA convention of Chicago, April 2007

"Factors Predicting Faculty Research Productivity." Poster paper presented at the National Assessment Institute Conference, Indiana University-Purdue University Indianapolis, October 2006

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