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Leadership for scholarly excellence: a qualitative examination of department chair facilitation methods to promote research productivity in pre-tenure biological sciences faculty

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LEADERSHIP FOR SCHOLARLY EXCELLENCE: A QUALITATIVE EXAMINATION OF
DEPARTMENT CHAIR FACILITATION METHODS TO PROMOTE RESEARCH
PRODUCTIVITY IN PRE-TENURE BIOLOGICAL SCIENCES FACULTY

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College

in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
in
The Department of Educational Theory, Policy and Practice

by

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December 2006

Acknowledgments

Because of my Cajun background, I usually equate life in terms of food. A dissertation is very much like a gumbo. It is the mixture of a lot of different things that may not necessarily sound like they go together but in the end, the gumbo turns out to be fulfilling. So does a dissertation. In addition, making a good tasting gumbo takes patience, practice and time. So does a dissertation. Here is the gumbo of folks that helped to complete this dissertation.

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Abstract

Leading a large, highly productive department that must compete on the global stage requires an increasingly broad skill-set. This study investigates whether there are methods that life science department chairs can employ to enhance the research productivity of their pre-tenure faculty and examines if leadership at the department chair level matters. Using a qualitative approach to examine six highly successful life science departments and their leaders as well as focus group interviews with nine pre-tenure faculty members, this study brings new discovery to the field of department chair leadership. This study validates the importance of department chair leadership while revealing the special skill-set that is important, the positive effects of mentoring on pre-tenure faculty, and that motivation may be linked to the culture of an organization. The results of this research are important for higher education institutions looking to build department of scholarly excellence, especially in the life sciences. Keywords: department chairs, fully engaged leadership, mentoring, research productivity, scholarly excellence

Chapter 1: Introduction

Many research universities are responding to fiscal, political, and competitive pressures with a rankings-driven “arms-race” (Fain, 2005). As Lovett (2005) notes, there is an ongoing trend of U.S. universities to alter their mission in order to join the avid quest by institutions for places at the top of higher education's prestige pyramid. Toma (2003) describes this focus on status as an obsession for universities. Newman, Couturier, and Scurry (2004) claim that colleges have been focusing their energies on a form of competition based not on improving graduates' skills and knowledge but on institutional prestige and revenues and that competition has been exacerbated by the rise of an expanding array of college rankings by publications like *U.S. News & World Report*, *The Princeton Review*, and *The Financial Times*. Michael Arnone (2003) in an article titled *The Wannabees: More Public Universities Are Striving to Squeeze into the Top Tier. Can States Afford It?* says:

These striving universities see becoming a national research university as vital to their missions. They argue that their regions need more research universities, which act as engines for state economies. Furthermore, these universities dream of nurturing the start-up companies for the next Silicon Valley or Research Triangle Park. (p. 8)

There is additional pressure on U.S. institutions by the Canadian government as Birchard (2004) describes a plan designed to reverse the country's brain drain, attract international researchers to Canada, and restore prestige to the nation's public universities by creating 2,000 research chairs. Armstrong and Sperry (1994) note that research is the foundation of a school's prestige. The combination of these activities have created an unwritten public policy that forces universities to become much more than spaces for growth, experimentation and maturation opportunities. The

conversion of higher education institutions into market enterprises will proceed apace, if for no other reason than that market income will continue to substitute for public appropriations (Zemsky, Wegner, & Massy, 2005). Johnson, Hanna, and Olcott (2003) note that “there are significant forces placing greater pressures on the academic enterprise suggesting that universities will have to adapt and change to retain their vital position and societal role.” (p.13)

Derek Bok (2003), former president of Harvard University, notes that now more than ever, [universities] have become the principal source of the three most important ingredients of progress in a modern, industrial society: expert knowledge, highly educated people, and scientific discoveries. At the same time, he continues, in a depressed economy, with the federal budget heavily in deficit and state governments cutting investments in higher education, campus officials are confronting a chronic shortage of money to satisfy the demands of students, faculty members, and other constituencies. Bok suggests that as a result, university administrators are under great pressure to become more entrepreneurial. They feel compelled to search more aggressively for novel ways of making profits that can help meet pressing campus needs. Increasingly, one reads of new lucrative ventures launched by one university or another such as medical-school consortia to test drugs for pharmaceutical companies. Bok describes this phenomenon as the “entrepreneurial university,” and claims that these universities are led by resourceful executives, and that these institutions are often portrayed in books and articles as constantly looking out for new and ingenious ways to serve society's needs while reaping profits with which to scale new pinnacles of excellence and prestige.

Because of the shrinking amount of new funding from state governments for higher education and the increase in the number of schools pushing to enter the mythical prestigious top

tier, universities must become more strategic in their quest. Lyall and Sell (2005) note that states now face outdated revenue structures, significant spending demands for other needs (healthcare, homeland security, PK-12), and a political consensus for tax reduction, all of which make it more difficult to sustain public investment in public universities. Fischer (2005) notes that state governments are less likely to have the funds necessary to seriously support expensive, yet important research in the life sciences. Much like the business owner who searches for an under-served niche, the university must exploit the academic disciplines that will bring them the prestige to attract private donations and larger research contracts with the potential for technology transfer profits. In fact, between 1980 and 2003, industrial contributions to academic research rose from \$236 million to about \$2.2 billion in 2000 and provided around 7 percent of academe's research money, according to the National Science Foundation (Guterman, 2005). Ultimately, today's successful universities must extract the most research productivity out of their faculty.

Successful faculty, those who garner large external grant funding, publish articles in the top journals, create intellectual property, garner publicity for their institutions and are selected for the nation's elite academies, are usually the same faculty who can demand high salaries, expensive labs and equipment, large teams of research associates, post-doctoral researchers and graduate students, and professorships and chairs that enhance their salaries. For many public universities, the dilemma exists between hiring away "star" faculty from other institutions or "growing" their own. Most public universities are forced to focus on the latter and that is where this study intends to focus.

Since the cost of recruiting, hiring, starting up and maintaining successful faculty usually begins with the initial hiring decision made when a new assistant professor is chosen, the focus in this research study will be on chairs and pre-tenure faculty in highly successful departments. My decision to explore the biological sciences is driven by the idea that the value of the high stakes area of life and health-related research is easily understood by the general public, the benefits of the research are applicable in most cases, and the cost to conduct research in these areas is relatively high. (Throughout this study, the terms life sciences and biological sciences will be used interchangeably. They both are used to describe departments that include aspects of biology, biochemistry, botany, microbiology, zoology, etc.) The convergence of all of these factors combine to make the facilitation and mentoring of faculty towards research productivity by their department chairs the most important part of this process. In order to be successful, a department chair must be able to attract and retain highly productive faculty members who in turn bring prestige and publicity to their institutions.

Background/Overview

In order to understand the need and importance of this study, it is necessary to discuss several areas inherent to the topic at hand. The relevance of research in the biological sciences has increased with increasing globalization essentially creating a world with smaller, more connected societies. The spread of deadly diseases and viruses is more difficult to control because of the number of people who travel the globe for business, education and leisure. As the problems have become more pressing, the United States government has increased the amount of funding directed at combating infectious and deadly diseases. This has led to many discoveries in the laboratories of the nation's colleges and universities that are saving and prolonging lives.

But the nature of our capitalistic economy dictates that the higher the demand for something, the more expensive it can be. Thus, the costs of hiring faculty in the life sciences has increased. In addition, it is costly to outfit and maintain a laboratory for a highly successful scientist. At most colleges and universities, the department chair is charged with recruiting, mentoring, and retaining a productive faculty. The combination of these occurrences has caused department chairs in the life sciences and elsewhere to uncover new and varied techniques that will aid their quest for funding to support the teaching, research and service missions of their units. While there have been studies directed at department chair leadership in general, I was not able to uncover research that focuses on the life science disciplines specifically. These difficult and challenging times call for a study of this type. In addition, I chose to focus on the biological sciences for three distinct reasons: 1) the external funding at the federal level is plentiful; 2) the research can lead to discoveries that save lives; and, 3) the cost of hiring, retaining, and supporting a faculty member in this area is very expensive relative to other faculty hires.

Impact of the Biological Sciences Research Areas

Nanobiotechnology, biogeochemistry and bioinformatics are terms that have recently emerged in the research lexicon and describe bleeding edge topics that scientists in the biological sciences are now interested in exploring. Nanobiotechnology is the application of nano-scaled materials to products. Nanomaterials are present in some sunscreens, toothpastes, sanitary ware coatings and even food products. Biogeochemistry is the scientific study of the interactions among the biological, geological, and chemical systems of Earth, including the cycling of matter and energy through them. Bioinformatics is the science of developing computer databases and algorithms to facilitate and expedite biological research, particularly in genomics. When one

examines the economic markets for products produced from nanobiotechnology alone, it is estimated to be over \$3 billion by 2008 (NanoInvestorNews.com, 2004). Colleges and universities forced to maximize scarce resources are focusing on this high-stakes area based on financial models indicating a high probability of return on investment. Discoveries in these areas have the potential to create intellectual property that can be spun off into new businesses. A solution to a previously unexplainable disease can bring fame and prestige, maybe even a Nobel prize, to the researcher and by extension, the university. These factors are in addition to the obvious benefits public health initiatives can have on mortality rates, life spans and medical care. These potentialities continue to strengthen the argument that the mentoring methods in the biological sciences are vitally important to research funding, institutional reputation, and corporate partnership opportunities. For example, University of Chicago economists Kevin Murphy and Robert Topel calculate that stopping cancer deaths would be worth more than \$800 billion every year (Milken, 2003). In addition, close proximity to teaching hospitals, medical schools, and research centers, encourages more effective means of communication and interaction among doctors, scientists and faculty, which in turn creates a positive impact on the development, retention and attraction of human capital and influences business decisions on where to situate (DeVol, et. al., 2005).

Funding at the Federal Level

The federal budget for fiscal year 2005-2006 shows a growth rate of seven percent for the National Institutes of Health (Federal Grants & Contracts Weekly, 2005). This compares favorably with the other federal agencies that fund research projects at colleges and universities, most of whom are facing budget cuts. In the 2003 fiscal year, the NIH's discretionary budget, or

spending not required by law, was larger than all but four of the 15 cabinet-level departments in the federal government (Brainard, 2004). The push for more funding may not be subsiding as shown in a recent National Research Council report urging the NIH to provide more research-grant money (Brainard, 2005). In addition, college lobbyists and leaders were disappointed by the appropriations for the National Science Foundation, along with the NIH one of the two largest sources of money for academic research. The NSF's budget shrunk in 2004-05 by \$111-million, to \$5.5-billion, despite Congress's promises to double spending on the agency by 2007 (Chronicle, Dec., 2004). The cut makes it highly unlikely that the NSF's budget will reach \$9.8-billion by 2007, the level Congress authorized in 2002. In an article in *The Chronicle of Higher Education* (2003, April), much is made of the swing by many universities to new areas of research connected to the U.S. government's homeland security initiatives. After the terrorist attack of September 11, President George W. Bush pushed to increase the amount of research money spent on dealing with issues related to bioterrorism. Researchers in the biological sciences were already studying many of the world's deadliest biological agents, like the anthrax and botulism bacteria and the Ebola virus. But the lure of almost \$70 million dollars in new funding has only worked to enhance the decision of hiring in the biological sciences. The five year rise in spending on the NIH has been spectacular by federal-government standards, surpassed in recent years only by spending on homeland security (Brainard, 2004). The amount of funding provided by the NIH, NSF, and DHA provides a significant opportunity for faculty interested in research in the biological sciences.

Discoveries That Save Lives

Despite great progress in the fight against cancer, one American dies from the disease every minute and one out of every two men and one out of every three women in their lifetime will be told they have cancer (National Nanotechnology Initiative, 2004). The experiments, equipment, and chemicals used to conduct research by the scientists in the biological sciences may be difficult for most members of the general public to understand, but the possible outcomes are not. People understand fully that the cures for cancer, diabetes, heart disease, Sickle Cell anemia, and HIV/Aids are probably being developed right now in a research and development lab on some college campus, university hospital, or research facility. Colleges and universities that are making discoveries in fields that involve public health issues are seen as institutions that are useful and worthwhile. In addition, recent studies have found that the overall U.S. industrial base relies heavily on public science, i.e., knowledge that originates from universities, research institutions, and government laboratories (McMillan, Narin, & Deeds, 1999). Public science is defined as scientific research performed in and supported by governmental, academic and charitable research institutions. Narin et al. (1997) found that during 1993–1994, 73% of the scientific papers cited by U.S. industrial patents were from public science sources, while only 27% were authored by industrial scientists. Blackburn and Lawrence (1995) report that our universities generate more research than all other agencies combined. According to Zucker and Darby (1997), the bioscience revolution is not complete; however, biotech is certainly making an accelerated contribution in the production of biological agents and methods to evaluate different compounds. The work of bio-scientists continues to be important as noted by Senator Tom

Harkin, an Iowa Democrat and one of the NIH's biggest supporters in Congress. In testimony before Congress in January 2004 he said,

There's a reason it's the "National Institutes of Health" and not the "National Institutes of Science." We expect the NIH to be actively involved in translational research. Yes, you get the basic science done, but we want to know, how does that help us lead healthier lives? (Brainard, 2004). (p. A17)

The general public and industry rely heavily on the activities of the biological scientists and researchers. The stakes are high and department chairs have additional pressure to provide mentoring to facilitate research and scholarship productivity.

The Cost of Hiring a Star Scientist in Biotech

Because of the problems described above, the competition to hire scientists to staff the departments of biological sciences, comparative medicine, or biomedical engineering has increased in recent years. In addition, state governments are struggling to provide the necessary funding to maintain public colleges and universities and many legislators are demanding accountability and return on investment from these same institutions. Because of the added pressure on universities to produce intellectual property, the ability of scientists to attract corporate partnerships and produce technology transfer has created another layer to the competition for these special faculty. Zucker and Darby's (1996) research uncovered the critical role that 'star' scientists play in predicting when and where biotech companies will appear, and how successful these companies may become. They determined that adding a star scientist to a faculty can be similar to attracting a successful business to a city. The star scientist must have a laboratory with a staff of researchers. In addition, the scientist will attract undergraduate and

graduate students. All of these folks require housing, buy products, and pay taxes. Many times they also bring a family with them thus expanding the economic impact of the original hire.

Successful biological science faculty operate laboratories with teams of researchers, who are also highly educated and earn handsome salaries. As the costs for setting up a state of the art research lab continue to rise, department chairs are forced to seek additional help to provide the funding necessary to recruit and attract top notch scientists to their campuses (Torr, 2002). In addition, the added costs of time spent on a search process both by the faculty and the department chair increases the commitment of the entire department. Finally, the emotional costs incurred by a department of conducting a search, successful or not, illustrate that successful hiring decisions cannot be measured only in dollars. The emotional costs affect both the recruits and the department in terms of expending faculty energy (Dettmar, 2004). A new junior faculty hire in a biological science discipline can “cost” the university anywhere between \$43,000-84,000 in salary (Chronicle, 2004) plus the cost of a start up package which may include \$100,000-\$1,000,000 to support the creation of a research laboratory. Many institutions now provide research enhancement programs designed to assist new faculty members to develop an effective and productive research plan. Factoring in this support can add another \$30,000-50,000 to the faculty development costs shouldered by the institution. The commitment of this substantial amount of funds is not trivial. Suddenly faced with releasing a current hire and starting over again, the department chair is challenged to ensure not only that each faculty hire is the right one but also that the new faculty member is mentored to produce maximum benefits for the institution. In addition, the right hire could produce substantial external funding and intellectual

property generation thereby producing a steady stream of additional income that could be used to enhance the department (Torr, 2002).

There are other concerns that add to the complexity of a faculty search. Inherent in this process is the need for department chairs to be concerned with a new faculty's integration into the department. Additionally, there is a concern that the new hires will ultimately become institutional citizens who share a collective responsibility for creating the character of their departmental units and, by extension, the university as a whole. Recruiting faculty can be a difficult, time-consuming, and thankless job for department chairs (Perlman & McCann, 2003). Today's more competitive academic environment endangers a faculty member's chances for success (Blackburn & Lawrence, 1995). In addition, faculty members who are most productive (in publications and especially in grantsmanship) are often in a position of strength when bargaining with department chairs and higher-level administrators: a threat to decamp for another university usually carries considerable weight in salary negotiations and related matters (Hammond, 2002). While all department chairs face this situation, the problem is exacerbated by the tremendous financial commitment associated with hiring biological science faculty members. Faculty hires in the arts, humanities and social sciences simply do not cost as much.

Competition for Faculty Hires

The high stakes field of biological sciences is an area of growth in the federal research funding arena, especially at the National Institutes of Health (Chronicle, April 2005). The reason seems quite clear. The general public has a vested interest in most of the research that the NIH funds. It is easy for most Americans to make the connection between research in the labs and the discovery of cures to diseases, the development of new drugs and the production of new medical

devices. All of these factors stiffen the competition for hiring smart, research active, biological sciences faculty members because new graduates of prestigious biological science programs are able to select between numerous offers at universities, federal labs, hospitals, and corporations.

A department chair faced with hiring a new faculty member in a biological science department is challenged to devise a recruitment plan that is clever and incisive. The department chair must craft a selection committee that will have the right mix of appropriate connections, expectations, ambitions, and collegiality. To take advantage of the search process as a strategic opportunity, chairs have to take into account the composition of the search committee, the content of the position announcement, and the organization of the interview so as to attract the kind of candidate the department needs (Bensimon, Ward, & Sanders, 2000). Once the faculty committee has made its recommendation, the department chair must conduct an exhaustive examination of the potential hires, not only looking at the vitae, contacting references, and evaluating the academic credentials, but estimating the potential for the right candidate to be productive both in scholarship and teaching. The exceptional faculty member is prepared to start a new position and “hit the ground running” on research, but most new faculty are unclear about expectations for research, how to get started, and how to build a coherent research plan (Boice, 1992). The enterprising department chair will likely also attempt to predict the ability of the right candidate to generate external funding and intellectual property. In addition, the department chair may be forced to look for a source of funding outside the university to provide an enticing employment offer for faculty in the high stakes area of biological sciences (Brender, 2004; Colecchia, 2004; Fischer, 2005). But how does a new department chair discover this important information?

Chairs Shape Search Committees

Of the many responsibilities that department chairs have, the one that has the greatest departmental and institutional consequences is hiring new tenure-track faculty and seeing them through tenure (Bensimon, Ward, & Sanders, 2000). In most instances, faculty committees are still appointed to conduct new faculty searches. But the person usually making the decisions about who serves on these committees, how they are conducted, and if and when the offer can be made is the department chair. Chairs make decisions regarding the composition of committees, most prominently those of personnel and search committees, and allocate teaching assignments and space, as well as make or influence salary decisions (Niemeir & Gonzalez, 2004). The ability to negotiate and make the offer to the candidate, as well as to convince the dean and other administrators of the need for the hire lies with the department chair. There is some material on best practices for chairs to use in recruiting faculty like Gmelch and Miskin (1995) who devote one quarter of their book *Chairing an Academic Department* to the issue of recruitment of faculty. Leaming (1998) devotes an entire chapter to the topic. Even those who claim that the decision is a shared task acknowledge that the most frequent opportunity for shared governance occurs between the department chairs and their faculty (Whitson & Hubert, 1982) . The need exists for more research in the area of department chair leadership. Bensimon, Ward, and Sanders (2000) conclude “intense, daunting, and lengthy as it is, the process of recruiting, hiring, orienting, nurturing, and retaining new faculty is seldom examined, barely understood, and largely ignored” (p. xiii).

Filling the Research Gap on Leadership

The missing ingredient to the leadership development dilemma continues to be providing the training necessary for the department chairs in the biological sciences to make decisions about facilitating and mentoring of pre-tenure faculty toward research productivity. The literature on department chair leadership is growing but most higher education leadership research has focused on the role of the university president (Ramsden, 1998; Shaw, 1999) and the adoption of the business model that tries to compare the role to the corporate chief executive officer (Bok, 2003; Oblinger & Verville, 1998). Other studies focus on university leadership in general. Yet these broad studies tend to conclude that all leaders at the university face the same issues, challenges, and problems. Still other scholarly work focuses on how university leaders should behave instead of how they actually do behave. This perspective usually reveals managerial skills or “meaning management” rather than what behavior is facilitative of productive departments, colleges or universities. Bechner and Kogan (1992) add that the current literature fails to map out the contours of leadership. Even books focusing specifically on the department chair as leader (i.e. *The Department Chair’s Role in Developing New Faculty into Teachers and Scholars*, by Bensimon, Ward & Sanders, 2000) do not examine the unique roles of department chairs leading biological science units. The focus that sets this study apart is the emphasis on the methods that department chairs in highly successful life science departments utilize to encourage research productivity of pre-tenure faculty. Several sub-disciplines in the life science areas are what I would term “high stakes.” They are extremely competitive and have large amounts of research funding available at the federal, state, and corporate levels. In addition, the research involves making discoveries that can save lives.

Statement of the Research Problem

This study investigates whether there are methods that life science department chairs can employ to enhance the research productivity of their pre-tenure faculty. The research also examines if leadership at the department chair level matters when it comes to building and maintaining a highly successful life science department. In this time of limited funding growth for public universities in the United States, the study will also focus on what we can learn from department chairs in highly successful departments of life sciences about developing a climate and culture that encourages their pre-tenure faculty to build a productive research program. While the market grows more competitive, the study will attempt to discover whether the means and methods for recruiting these biological science faculty have changed at our colleges and universities. The research may uncover the implementation of new training programs tailored for our chairs who are tasked with leading these biological science departments. In addition, this study investigates whether these same department chairs are equipped to provide the guidance, facilitation, and mentoring necessary to ensure that new faculty hires are successful in garnering external funding and publishing scholarship.

Research Questions

1. What are the methods a department chair may employ to create a positive climate that leads to a productive department as measured by external funding and scholarship publications?
2. What are the methods that department chairs of highly successful biological sciences departments employ to facilitate junior faculty research productivity?

3. What do pre-tenure faculty believe about the role of the department chair in facilitating their research program?

Study Limitations and Delimitations

By focusing the study on life sciences departments, I felt that facilitation methods could be clearly identified that could be used to enhance the training available to department chairs. In addition, I expected the data to validate or disprove current theories related to department chair leadership. Qualitative research has natural generalizability limitations and the results of this study may not be applicable to all higher education institutions, departments, chairs or faculty. In general, it is clear that a given phenomenon, situation, or response may be appropriate for one person or situation but not for another. Another limitation involves the method of data collection. It requires an opinion and perception of each of the participants. This lived experience is authentic and from an ethnographic naturalism perspective, exactly what this inquirer intended to capture. The probing questions, observation of body language and evaluation of additional material combine to reveal the lived experience by the particular actors in this particular circumstance. But the evaluation of the data in this instance is infused with the interpretation of this researcher.

This study is intended to focus a sharp eye on the culture of life science departments. I purposefully only selected department chairs who were in their current positions for more than five years as I wanted to avoid the typical learning curve that can inhibit the effectiveness of a new leader (i.e. policies and procedures, budgeting, institutional hierarchy). In addition, I hope that this study will allow new voices to emerge about the needs of pre-tenure faculty. I realize that the experiences of biological scientists are quite different from English scholars or

anthropologists and that is precisely why I think this narrowly focused study will be important in revealing nuances specific to this area of research.

Qualitative studies by their very nature are not designed to be generalizable to all situations. This research study reveals valuable information for department chairs in the life science disciplines, the deans who supervise the chairs, and higher administrators who are concerned with the research and scholarly production of these units. These departments are very large, well funded, and stable units. Many of the suggestions may not work in small departments with limited resources, institutions that have teaching as a focus mission, or units that do not have funding opportunities as plentiful as the life sciences. But many of the methods used to develop culture and climate are certainly transferable. In addition, the attitudes exhibited by the department chairs can and should be emulated by anyone who plans to lead an academic unit at any institution.

Qualitative research does not collect numeric data from a representative sample of the target audience. As a result, this type of research cannot be subjected to statistical analysis to estimate to what extent opinions expressed by participants reflect the opinions of the population studied. The most important implication of this limitation is that researchers should refrain from drawing any conclusions about the actual prevalence of specific concerns, attitudes, or beliefs among the target audience.

Some participants tend to express views that are consistent with social standards and try not to present themselves negatively. This social desirability bias may lead respondents to self-censor their actual views, especially when they are in a group setting. Program planners

should critically examine the results and recommendations of qualitative research studies within the broader context of their own training, expertise, and familiarity with the target audience.

The quality of the data collection and the results are highly dependent on the skills of the moderator or interviewer and on the rigor of the analysis. Because all of these methods are dependent on interpersonal exchanges with respondents, any number of variables, including the dress, demeanor, and language used by the interviewer may influence the quantity and quality of information given by respondents. The skill and experience of the analyst(s) also influence how well the data are summarized into themes and insights that are useful for subsequent program planning.

Significance of the Research

From my review of the literature, I discovered there is a gap to fill in this area. Although there have been studies focused on leadership in general, faculty development in various disciplines and the role of the department chair (Gerstenberger, 1981; Gmelch, 2002; Robinson, 1996), they have not focused on the biological science disciplines. The research studies to this point have been focused on examining department leadership and faculty productivity in a very broad sense (Bland, Weber-Main, Lund, & Finstad, 2005; Middaugh, 2001). Focusing only on biological sciences departments is important because the research results are important, relevant, and impactful and the funding for the research is plentiful, competitive, and significant. In addition, carrying out the research in the biological sciences is expensive. The decisions made by the department chair on the selection, retention, and development of new faculty hires gains importance because of all of these factors, which are also compounded by the shrinking financial support from the state that most of the public research institutions are facing. In many

institutions, the success of departments that can generate large sums of external funding provides the foundation of capital to create various general support programs to help with the development of faculty and their research programs throughout the university. That there is a lack of focus on this area then seems an opportunity to provide new insights to the broad category of department chair leadership but most specifically to leadership in the high stakes arena of the biological sciences. Blackburn and Lawrence (1995) note that existing research on scholarly productivity has focused primarily on the direct effects of sociodemographic, career, and sometimes organizational factors. Few studies, however, have discussed the relationship between productivity and the influence of the department chair. I also feel that biological science departments will have reached a certain maturity when it comes to their efforts toward procuring external funding. The fields of biology, zoology, and microbiology are not new. The foundations of these sub-disciplines have been well established for more than a century. Historically, these areas have been studied in federally funded research for longer periods of time than most arts, humanities, and even social science disciplines. These sub-disciplines also have access to much larger amounts of funding and the options for the researchers are certainly more plentiful than their colleagues in other areas. The last several presidential administrations have shifted their federally funded research efforts to focus on health, life course, and medical issues. The other benefit of this focus will allow me to utilize the data resources of the National Science Foundation and the National Institutes of Health which are accessible, current, and extensive. The combination of these facts produces a formidable argument for taking a focused look at the biological sciences as a model for productivity.

Researcher's Perspective

Before conducting a qualitative study, a researcher must do three things. First, a naturalist paradigm must be adopted. Lincoln and Guba (1985) describe the naturalist paradigm as having the following axioms: “1) realities are multiple, constructed, and holistic; 2) knower and known are interactive and inseparable; 3) only time- and context-bound working hypotheses (idiographic statements about the individual) are possible; 4) all entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effect; and, 5) inquiry is value-bound. Second, the researcher must develop the skills appropriate for a human instrument, or the vehicle through which data will be collected and interpreted. Finally, the researcher must prepare a research design that utilizes accepted strategies for naturalistic inquiry” (p. 36-38). In addition, Spradley (1980, p. 73-76) notes that qualitative researchers must ask the five following questions: “1) What do my informants know about their culture that I can discover?; 2) What concepts do my informants use to classify their experiences?; 3) How do my informants define these concepts?; 4) What folk theory do my informants use to explain their experience?; and, 5) How can I translate the cultural knowledge of my informants into a cultural description my colleagues will understand?”

Glaser and Strauss (1967) and Strauss and Corbin (1990) refer to what they call the "theoretical sensitivity" of the researcher. This is a useful concept which I have used to evaluate my skills and readiness to attempt a qualitative inquiry. Theoretical sensitivity refers to a personal quality of the researcher. It indicates an awareness of the subtleties of meaning of data. “[It] refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand, and capability to separate the pertinent from that which isn’t” (Strauss & Corbin,

1990, p. 46-47). Strauss and Corbin opine that theoretical sensitivity comes from a number of sources, including professional literature, professional experiences, and personal experiences. Having spent the last 21 years in academia, specifically in the research arena, I have developed valuable skills and garnered the necessary insight to evaluate the data to be collected. I am often able to decipher what a person's ideology and assumptions are by listening and asking questions. The credibility of a qualitative research report relies heavily on the confidence readers have in the researcher's ability to be sensitive to the data and to make appropriate decisions in the field (Eisner, 1991; Patton, 1990). My professional experience as a higher education administrator in the research arena provides a steady foundation for this project.

Lincoln and Guba (1985) identify the characteristics that make humans the "instrument of choice" for naturalistic inquiry. Humans are responsive to environmental cues, and able to interact with the situation; they have the ability to collect information at multiple levels simultaneously; they are able to perceive situations holistically; they are able to process data as soon as they become available; they can provide immediate feedback and request verification of data; and they can explore atypical or unexpected responses. This human process, more than anything, is the reason I want to gather this data through qualitative methods. My communication skills, both verbal and non-verbal, as well as my inquisitive disposition and sensitivity lend themselves well to the task at hand.

A self-evaluation has provided me with the confidence to pursue this qualitative study using grounded theory and case study methodologies. I have previously participated in interviews, observations, transcription, and coding exercises both for academic purposes and

scholarly output. I am comfortable with the interview process and plan to use a standardized, open-ended format as described by Patton (1990).

Researcher Bias

All researchers have biases that influence their results (Mehra, 2001). Researcher bias and subjectivity are commonly understood as inevitable and important by most qualitative researchers. Experienced researchers and experts in the field of qualitative research see self-discovery as essential to learning about qualitative research (Brown, 1996). Simmons (1988, as cited in Brown, 1996) regards awareness of one's "biases, blind spots, and cognitive limitations ... as high a priority as theoretical knowledge" (p. 77). Scheurich (1994) remarks that one's historical position, one's class (which may or may not include changes over the course of a lifetime), one's race, one's gender, one's religion, and so on - all of these interact and influence, limit and constrain production of knowledge. Krieger (1991) argues that the outer world, or our "external reality" is inseparable from what we already know based on our lives and experiences - our inner reality. Krieger further asserts that the knowledge of the external world is only a minor part of what our total knowledge can be; what we ever really know is, in essence, self. Thus, our reality is based on our understanding of the world, which in turn is based on our knowledge of the self. Denzin (1989) comments that all research is really about the researcher, but in order for the research to be of value it must move beyond the researcher and researcher's situation. Accepting that research is not value-neutral allows qualitative researchers to utilize their critical thinking and reflection skills.

I am employed in an administrative position in the Office of Research at Louisiana State University (LSU). LSU is a Carnegie designated research-extensive (formerly described as

Research I) university which places it among the nation's elite in terms of external funding, publication productivity and doctoral graduates. Although I have spent the last twenty years in research administration at a flagship, research-extensive university, I do not consider myself a proponent of having either research or teaching being the dominant force on campus. I think the best institutions find a way to support both efforts to the benefit of their faculty, staff, students, and constituents. But if I did not believe in the value of research that occurs at our nation's universities, it would seem odd to be in this position. I am tasked with facilitating the development of faculty research programs. I spend my days attempting to match faculty with funding agencies that will support their projects. I listen to passionate people talk about the problems and puzzles that intrigue and frustrate them. So the initial bias I bring to this project is the high esteem I place on research, discovery and creative scholarship. I think that it is important. I think that the U.S. government should continue to allocate millions of its precious dollars into university research. I am convinced that it serves the greater good for society to have these projects and the results that emerge. So I acknowledge an inherent bias to the benefits and value I think research, scholarship and discovery bring to the world. I am also part of the administrative team and not of the faculty. Some would describe my position as bureaucratic. I believe that faculty as a group are intelligent, hard-working and passionate. Most are committed to discovering solutions to some of the toughest problems faced by society.

My decision to focus on the biological sciences arena has more to do with the relationship research has to our daily lives and the amount of funding available for researchers than anything else. As I have mentioned before, I regard research in this area as high stakes both in impact and consequences. I am not choosing to focus on race or gender as determinant factors

related to success or productivity but either or both may emerge in the course of the interviews. My participant selections will be drawn using empirical data that measures the effectiveness of a department chair's leadership and the department by examining three things: high yearly research external funding; high yearly publication record; and, recommendation by leading researchers in the life sciences disciplines. The bias towards biological sciences research I am exhibiting here has nothing to do with the value I place on this type of research over another. As a social scientist, I am firmly convinced that research involving the study of humans and their lives is the most difficult to examine, control, or determine generalizations. I am choosing to focus on the area of biological sciences because of the investment costs incurred by institutions committed to hiring researchers in this area. But I also submit that this is indeed a social science oriented project as I intend to examine attitudes, relationships, opinions, and cultures. It is the human dynamics of leadership and followership that draw me to this study.

Organization of the Study

Chapter 1 has presented the introduction, statement of the problem, research questions, significance of the study, definition of terms, and limitations of the study. Chapter 2 contains the review of related literature and research related to the problem being investigated. The methodology and procedures used to gather data for the study are presented in Chapter 3. The analysis and findings from the data provided by the department chairs is included in Chapter 4. Chapter 5 provides the pre-tenure faculty data analysis. Chapter 6 contains a summary of the study and findings, conclusions drawn from the findings, a discussion, and recommendations for further study.

Chapter 2: Literature Review

Organizations that are highly successful tend to have one thing in common: good leadership. Not just at the top but at all levels. This research study is concerned with higher education leadership at the department chair level. In order to understand more about leadership at this level, it is important to examine what the current literature has to say about numerous topics interrelated to department chairs. Concept mapping helped to determine that the logical start was in the areas of leadership and followership. While the vast majority of the literature focuses on the business world in leader-follower relations, there is some important research specific to higher education. A broad understanding of mentoring, interpersonal relationships and collegiality was determined to be crucial to this study as well. The data reveal that these areas would emerge as methods utilized by the department chairs in these highly successful units.

Determining the characteristics of administrators and more specifically the roles and responsibilities of the department chairs allows a closer examination of the data. This material proved to be very useful in determining that the department chairs role is complex and multidimensional. Narrowing the focus towards uncovering research and findings on leadership techniques and mentoring models used by department chairs was the next logical step. This information definitely provided an opportunity to compare the existing techniques to the specific areas of leadership in the life sciences. In addition, the mentoring models exposed the variety available to the leaders but also revealed their lack of understanding about the various choices. The broad topic of followership was narrowed to the literature on faculty roles, expectations, motivations, rewards, and productivity. This material would prove useful during the pre-tenure

faculty interviews as well as the sessions I spent with the department chairs. It is important to realize that the research enterprise is having an impact on the institutions in a variety of ways. The existing literature was slim but informative. Finally, there are external forces impacting higher education. This study is concerned with research and scholarly productivity. Faculty perform research to solve problems and make discoveries. How this inquisitiveness can be paired with larger societal needs is an important connection as well.

Leadership and Followership

A basic understanding of leadership and followership is important to any discussion about university department chair leadership and the facilitation and mentoring of faculty members. Although the university may not necessarily adhere to traditional leader-follower paradigms, reviewing the available material on the broad topics is instructional for this research project.

In the beginning of any project or task is the leader and the initial focus on the literature was exposition of the material that explored the variety of styles available to one that chooses to lead. Leadership is a process, not a person (Hollander, 1992). Harvard University President Lawrence Summers claimed in his inauguration speech in October 2001 that “in this new century, nothing will matter more than the education of future leaders and the development of new ideas” (p.1). This statement makes two clear assumptions about leadership. The first is that leadership can be taught and learned. The second is that Summers assumes leadership is necessary for the facilitation of new ideas.

The variety of definitions for leadership are almost as plentiful as there are persons who have offered to define it. Pfeffer (1997) has noted that many of the definitions are ambiguous,

and others [Bavelas, 1960; Hollander & Julian, 1969] note that the distinction between leadership and other social influence processes is often blurred. Spitzberg (1986) adds that the meaning of leadership may depend on the kind of institution in which it is found. Bass (1990) offers the following definition:

leadership has been conceived as the focus of group processes, as a matter of personality, as a matter of inducing compliance, as the exercise of influence, as particular behaviors, as a form of persuasion, as a power relation, as an instrument to achieve goals, as an effect of interaction, as a differentiated role, as initiation of structure, and as many combinations of these definitions. (p.11).

Turning to the research about leadership styles and the debate about if leadership can be learned provides numerous models and answers. Fullan (2001) contends that anyone can improve her/his leadership skills by focusing on a small number of key dimensions that include moral purpose, understanding change, relationship building, knowledge creation and sharing and coherence making. He suggests that we examine leadership and management as virtually the same quality and prefers not to separate them because he feels they overlap and are both needed. He also examines if moral purpose has a place in leadership and concludes that without it, leaders will lose their followers. Fullan also takes on the concept of change process and how we need to understand it, declaring that innovativeness is more important than innovation and strategizing is more important than strategy. Finally he focuses on how leaders can improve their effectiveness by never becoming complacent and taking the time to reality-test their rhetoric with skeptics. Wheatley (1999) writes that leaders are obligated to help the whole organization look at itself to be reflective and learningful about its activities and decisions. Hollander (1992)

notes that every initiative need not come from a designated leader, but even while retaining authority and responsibility, a designated leader can interpret the role in facilitating and even coaching terms instead of conventional top-down, directive ones, so as to develop leadership skills in others. Greenleaf (1996) believes that leadership depends more on the pull of the overarching goals and building the competence and sustaining the autonomy of many decision makers. Dotlich and Cairo (2002) feel that traditional leadership qualities, skills, and responses are no longer consistently effective and call for unnatural leadership, a style that recognizes that leaders must behave in unnatural ways if they are going to be effective today. Northouse (2003) says that collectively the research findings on leadership from all of these areas provide a picture of a process that is far more sophisticated and complex than the often simplistic view presented in some of the popular books on leadership. This literature illustrates that pursuing a study of the topic of leadership is worthwhile. In addition, the literature determines that leadership is a multi-faceted process.

The human dynamic of leading emerges as the next area of focus. The literature here reveals various leadership traits that may be important to the research study at hand. Heifetz and Linsky (2002) claim to lead is to live dangerously because when leadership counts, when you lead people through difficult change, you challenge what people hold dear—their daily habits, tools, loyalties, and ways of thinking—with nothing more to offer perhaps than a possibility. They continue by noting that leadership is worth the risk because the goals extend beyond material gain or personal advancement; leadership provides meaning in life. Gardner (1993) says that leadership requires major expenditures of effort and energy—more than most people care to make. Hollander (1992) notes that although the early interest was in who becomes a leader, with

what traits and effects, new emphasis addresses questions about how leadership functions are performed in particular situations presenting varying demands. Wilfred Drath, in his book *The Deep Blue Sea: Rethinking the Source of Leadership* (2001) proposes the concept of relational leadership as a way to understand leadership in general. He notes that relational leadership pays attention to what whole system of relations as the creative ground for leadership. He derives this concept from earlier writings by Kenneth Gergen, Robert Kegan, Etienne, Wenger, and Nelson Goodman. Great leaders move us, ignite our passion, inspire the best in us, and work by accessing our emotions (Goleman, Boyatzis, & McKee, 2002). Hollander (1992) writes that leaders and managers are moral agents who can help others get in touch with their spirituality, which need not be religious in nature. Leadership then becomes a mode for bringing about change.

Understanding the process and human dynamic of leadership indicates that there may be models or theories that allow a closer examination through these lenses. Robert Birnbaum developed a cybernetic model for university leadership, that was described by many as organized anarchy. His theory was that university leaders have a limited role: because universities were cybernetic organizations, they regulated themselves efficiently and therefore did not need any authority to define and implement specific rules of functioning (Birnbaum, 1988). Substantial research, influenced by management theory, argues that the survival of universities in a turbulent environment depends on their ability to develop strategic management, introduce performance measurement, bring down costs, assess the quality of teaching and research, develop partnerships with external stakeholders and, of course, strengthen their leadership. In short, these authors were assessing the chances of universities to move from a traditional form of organization to a

more “entrepreneurial model (Askling and Kristenssen, 2000; Davies, 2001; McNay, 1995). Dill and Sporn (1995) considered that the dominant culture of universities was collegial and that leadership was bound to integrate academia opinions into institutional decisions; rather than impose their choices on the academic community, they suggested that leaders promote entrepreneurial values to win support. The writers in this section have drawn connections that suggest an appropriate path for leaders in a university setting might be to look to the corporate world for advice and examples. In truth, the skill sets for a position in both realms do include some overlapping items. In addition, there are skills that are unique to each position.

From theory to the mechanics of leadership, the focus returns to the idea of leadership as a learning opportunity. Green and McDade (1991) note that chairs should take advantage of workshops and seminars or the many leadership-style assessments that are available. However, Goleman (1998) offers that the efficacy of courses and workshops may be useless depending on the emotional intelligence of the participants. Reflective practice (Argyris & Schon, 1978, Schon, 1983) and systems thinking (Senge, 1991) provide means of analysis to clarify and learn from difficult problems. These learning processes require constant practice, but they can be most helpful and often lead to learning in groups in which feedback can be provided and reflective analysis accomplished (Seagren, Creswell, & Wheeler, 1993). Leaders and organizations would be better served if those responsible for professional development learned to create “circles of friends” (Hagstrom, 1998-99) who know how to ask open, honest questions and how to listen deeply. Many agree that an essential element in any kind of leadership development effort is the safe company of people who are willing to listen without trying to fix anything. Leadership is a

social and human enterprise; as such, it is essential that there be opportunity for leaders to speak to one another (Ackerman & Maslin-Ostrowski, 2002).

Leaders need followers in order to be effective. Comparatively little attention has been given to followers, who grant or withdraw support from leaders, as against the effects of the leader on followers (Hollander, 1992). Both leadership and followership represent active roles, given the reality that organizational functions require them at every level (Hollander, 1992). Post (1986) offers a “lock and key” metaphor in describing a type of follower who craves charisma and is then drawn to charismatic leaders. Post feels that just as a key fits one lock, certain followers are drawn to one type of leader. The increasing diversity of followers makes leader-follower relations more complex, though diversity has value as an end in itself (Hollander & Offerman, 1990). Mulder (1971) asserts that a follower’s autonomy and empowerment can be abused because the leader holds the balance of power.

The unfettered use of power can be dysfunctional and severely limiting to leader-follower relations (Hollander, 1997). Reich (1987) makes the point that, “We need to honor our teams more, our aggressive leaders and maverick geniuses less,” (p. 78) and he believes followers should be studied more carefully. Hogan, Raskin, and Fazzini (1990) highlight the importance of followers as perceivers with expectations of and attributions about leader performance. The role of follower can therefore be seen as holding within it potential for both assessing and taking on leadership functions (Hollander, 1992). Barnard's (1938) "acceptance theory of authority" stated that the follower has a pivotal role in judging whether an order is authoritative, insofar as: he or she understands it; believes it is not inconsistent with organizational or personal goals; has the ability to comply with it; and sees more rewards than costs in complying and remaining with the

organization or group. Legitimacy plays a pivotal part in the leader-follower relationship because it is the base on which followers perceive and respond to the leader (Hollander, 1992). Neustadt (1990) has similarly considered follower perceptions of legitimacy as one of two main sources of presidential power. The other he cites is the sentiment of loyalty, which can be partly accounted for in the favorable impressions, i.e., credits accorded by followers.

On balance, Hollander and Offerman (1990) found that by sharing power and allowing followers to influence them, leaders can foster leadership skills in others, as well as achieve other gains through their greater participation and involvement. The usual characterization of the follower role, then as low power and passive is misleading when considering followership as an active accompaniment to leadership. Although leaders are usually more active, especially in their directive function, followers can affect a leader as an attentive strategic audience (Hollander, 1992). Fodor (1974) studied the content of followers' feedback as a source of influence on the behavior of leaders. Two-way affirmation and influence are therefore constitutive to the leader-follower bond, which can be construed as credit followers can grant or withhold from their leaders, reflecting their loyalty and trust. Furthermore, qualities sought in good leaders, such as dependability, competence, and honesty, are also included among attributes of good followers (Hollander, 1992). The area of followership is much more complex than one might think. The literature brings to light a multitude of nuances that provide valuable data. It is evident that the topic of followership is ripe for further study. The link between leaders and followers is important and can be an enhancement or impediment to the success of an organization. As I focus on the methods that leaders of successful departments utilize, it is important to have the various models of leadership available for comparison. In addition, the

perception of the followers, in this case pre-tenure faculty, will be useful as well. With a clearer understanding of leadership and followership, I now turn to the more intimate relationship of mentoring.

Mentors, Mentoring, Interpersonal Relationships, and Collegiality

Mentoring as a method of performance enhancement has been used for many years in the business arena. A mentoring relationship involves a more experienced professional serving as a supportive and guiding role model for another professional who is less experienced in the field (Cunningham, 1999). Many people first experience a form of mentoring when they enter a university as a graduate student. The classic model used to educate graduate students in most U.S. institutions involves a mentoring relationship between the student and a faculty member. By focusing on the material that examines and reports on the mentoring occurring in the university setting, we are able to understand the impact relationships have on the complex world of the academy. At the same time and often in the same studies, the use of the term collegiality is also bandied about in the university setting but examining the existing research allows a clearer understanding of the meaning of that term and how it applies to the university. That is valuable to this research study because one of the benchmarks that department chairs strive for in successful units is a high level of collegiality among their faculty.

By examining the existing literature on mentoring, it informs the research questions and interview protocols developed for this study. Murray (2001) notes that facilitated mentoring is a structure and series of processes designed to create effective mentoring relationships; guide the desired behavior change of those involved; and evaluate the results for the proteges, the mentors, and the organization. The university has been using a mentoring relationship model in the form

of graduate education for many years. Graduate students trained by faculty mentors eventually become the faculty member themselves. This ritual allows for current faculty to be replaced by their students in the various research arenas.

It is also important for administrators to plan for their replacement in much the same way. Succession planning has become increasingly important in service and knowledge-based organizations (Rothwell, 2005). Chairs need to think and plan for their exit from the position so that they will leave at an appropriate time in their professional and personal lives (Kimble, 1979). Too often, chairs allow circumstances—including pressures to stay because no new leader is available or because the change would be departmentally or organizationally inconvenient—to influence their decision about when to step down as chair. Such situations are not in the long-term interest of the chair, the department, or the institution (Seagren, Creswell, & Wheeler, 1993). The literature related to the topic of department chair succession is fairly thin but is an important area that should be explored more fully.

What impact does mentoring have on an individual's productivity? Among the many collegial relationships that we form in academia, the mentor-protégée relationship directly contributes to scholars' success (Blake, 1999; Caplan, 1995; Keith & Moore, 1995; Long, 1990; Reskin, 1979; Smith & Davidson, 1992). Research indicates that mentoring influences academics' level of professional activity and productivity (Keith & Moore, 1995; Long, 1990; Reskin, 1979; Smith & Davidson, 1992). Mentors also guide novices through the "real rules" of a career (Caplan, 1995). Bensimon, Ward and Sanders (2000) note that deliberate, ongoing mentoring in the first year can help assure that all faculty have a positive experience as they enter into a new departmental culture. They add, in some departments the chair is a mentor to all

faculty and plays an active role in their development but in other departments, chairs assign each new person an experienced faculty member to act as a mentor for the transition. Part of the department chair's role as mentor is to let new and existing faculty know of one another's accomplishments and interests so as to create fertile ground for collegiality (Gmelch & Miskin, 1995). Most of our understanding of mentoring, however, comes from research that focuses on a particular kind of relationship, one involving an older, experienced person and a younger, less experienced one (Russell & Adams, 1997). Boice (1992) and Whitt (1991) have both addressed the issue of how intergenerational differences can produce cultural conflict or the emergence of dual cultures within a department. The literature about formal mentoring suggests that the process is beneficial and vital.

The relationships between departmental members can have a profound impact on the productivity and success of the department. The social environment and culture of the department takes on added significance in academic settings where the expression of ideas and dispersal of intellect are the "products" being offered. The collegial model of higher education organization and governance is based on the notion of a community of scholars. It emphasizes the professional authority of faculty and a prescriptive notion about the operation of the educational process. Jarvis (1992) concludes that perhaps the single most important factor in faculty development is the concept of collegiality. Development of collegiality is a central goal in all the best-known inter-institutional programs for junior faculty development, including those conducted by the Lilly Endowment and the Bush Foundation (see also Walvoord, Hunt, Dowling, & McMahon, 1997). The lack of early collegial support may have long-lasting effect. Boice (1993) found that the patterns of collegial isolation/neglect, collegial disapproval, self-

doubts about competence and feelings of victimization and suspicion among disillusioned mid-career faculty often has their origins in pre-tenure incidents. Bensimon, Ward, and Sanders (2000) note the lack of collegiality is a major stress factor for new faculty. Neumann (1993) refers to this process as collegueship and defines it as the range of relationships that may exist among professors—from friendship to contentiousness, from close and regular engagement to alienation, and everything in between. The combination of mentoring with an atmosphere of collegiality would seem to create an environment conducive to high productivity and satisfaction rates.

The culture of the institution, separate from the department, can also have a profound impact of the satisfaction and success of faculty. Administering the policies and procedures of an institution, especially on faculty matters, usually falls to the department chair. How these matters are handled contribute to the overall impression that faculty develop about their value to the institution. One important aspect that has emerged in this arena is the topic of pregnancy and maternity related leave. Scholars have pointed out that childbearing leave policies are interpreted and implemented differently across departments within universities (Orel & Whitmore, 1998). Department chairs, who tend to be men, make discretionary decisions about a woman's leave time, and women's requests are not necessarily accommodated (Armenti, 2003). Indeed, due to fear of reprisal, untenured women seem particularly vulnerable in their ability to seek and receive parental leave. Cook (2001) notes that the balancing act extends beyond a woman juggling children and her job; it also affects the woman's decision on when (or whether) to have children as well as their likelihood of getting tenure. Opponents of liberal parental leave policies suggest that faculty who take advantage of this option are usually less productive in their

research efforts. While many studies attempt to compare the effects of having children on the research productivity of faculty members, the cumulative results are inconclusive. Some researchers (e.g., Sonnert & Holton, 1995) report that having children has a negative impact on the publication rate of women faculty, while others (e.g., Cole & Zuckerman, 1987; Fox, 1995) found that the presence of children has no significant effect on the women's research productivity. According to Astin (1978), the discrepancies in these studies may be ascribed in part to variability in research productivity by discipline (natural sciences have higher publication rates), by rank (assistant professors publish less than associate professors who publish less than full professors), and by institutional setting (research universities have the highest publication rates). Similarly, Fox (1991) notes that productivity discrepancies may be explained by women's tendencies to hold lower ranks in the academy and to work in institutions with heavy teaching schedules and less research support. Although the issues of leave for pregnancy and productivity bring out supporters from both sides, the literature suggests that flexible policies may lead to a more satisfying culture. In summation, it is clear from the literature that a culture that encourages positive relationships and collegiality along with flexible policies are more prone to encourage an environment conducive to harmony and productivity.

Administrator Characteristics, Roles, Responsibilities, and Effectiveness

The broad revelations in the literature on leadership, followership, mentoring, and collegiality can now be used to guide us towards the more specific topic of university administration. Here we discover the roles and responsibilities that define the critical position of department chair. This literature proved to be invaluable to this research study focused on department chair leadership facilitation methods. The material from this section assured me that

the key to discovering why the departments in this research study were highly successful would be discovered by talking with the department chairs.

Department chairs occupy a crucial role in the organization of colleges and universities. Gmelch and Miskin (2004) call it the most critical leadership position in higher education. An estimated 80 percent of all university decisions are made at the departmental level (Roach, 1976), and the position of department chair is the most common entry point into the hierarchy of academic administration (McDade, 1987). As administrators responsible for evaluating and rewarding staff, chairs promote or inhibit the advancement of individual careers. As advocates for faculty, they serve as important communication conduits between academic units and the leadership of colleges and universities. As colleagues of faculty and staff in their departments, they must absorb the daily frustrations and concerns of individuals employed by these institutions. The chair is basically the only official on a campus who attempts to interpret the department to the administration and the administration to the faculty (Booth, 1982). In a dynamic environment subject to rapid demographic shifts, financial uncertainty and increased calls for accountability, chairs play a crucial role in ensuring program and institutional viability (Wolverton, Gmelch, Wolverton & Sarros, 1999). Over the past 40 years there has been a significant amount of literature devoted to understanding the distinctive role of the department chair and the special challenges that imposes on individuals in that role. Chairs are important in the overall academic leadership team on campus that may include staff personnel, deans, vice chancellors, provosts, and chancellors. As early as 1942, the chair was characterized as the “key position” in a department and in the institution (Jennerich, 1981). The first thorough study of department chairs was conducted in 1958 by surveying department chairs at 33 private liberal

arts colleges (Jennerich, 1981). An editorial in *The Journal of Higher Education* noted that “no one plays a larger part in determining the character of higher educational institutions than the department chairman (Patton, 1961). The literature shows that scholars agree on the relative importance department chairs have towards the success of academic institutions.

The importance of chairing a department revolves around three highly interrelated factors. First, chairs have daily contact with administrators, faculty, and students (Weinberg, 1984). In the administrative hierarchy of an institution, chairs oversee the department’s daily operations. Chairs have been called the single most important link in the campus structure between administrators, faculty, programs, and students (Waltzer, 1975). Second, chairs are important decision makers (Roach, 1976). Third, on most campuses, the chair holds authority over matters important to the faculty and staff: curriculum, budget, faculty hiring, and evaluation (Bennett, 1983; Carroll, 1990). The amount of research also seems to support the notion that department chairs are crucial to a university’s success.

In terms of roles and responsibilities, no mid-level administrative position in higher education has been analyzed as much as academic chairs. Since 1965, at least 15 studies has attempted to map the roles and responsibilities, addressing the tasks, duties, responsibilities, and activities of chairs (i.e.: Norton, 1980; Bragg, 1981; Jennerich, 1981; Tucker, 1984, 1992; Moses & Roe, 1990; Seagren & Filan, 1992, Gmelch & Burns, 1993, Gmelch & Miskin, 1993, Seagren, 1993). But most of the studies have either focused on theory or have been general in nature. I could not locate any studies that had looked at department chairs in the life sciences disciplines. In addition, there were no studies that attempted to uncover the facilitation methods used by department chairs to specifically enhance research and scholarly productivity.

University Department Chairs Roles and Responsibilities

In order to fully understand the challenges facing university department chairs, it is important to understand how the pivotal role emerged and evolved. The origins of the university system in the U.S. begins with the establishment of Harvard College at Cambridge, Massachusetts in 1636. The state university arose with the universities of North Carolina and Georgia in 1795 and 1801 respectively. With the advent of the Morrill Act of 1862, the land-grant college was created. In 1876 the German model of the research university was imported and used to create Johns Hopkins University in Baltimore, Maryland (Perkin, 1997). While the college president of only a few generations back often wrote all of his official correspondence longhand and a president like James B. Angell at Michigan registered entering students as well as taught them in addition to his other presidential duties, a marked change came over the office toward the end of the nineteenth century (Brubacher & Rudy, 1997). As faculty became more specialized and new departments were formed or grew, it became more difficult for a president to understand, govern, and manage the actions of individual faculty members. The larger the college grew, especially the larger its faculty grew, the more it became necessary to specialize and delegate duties (Brubacher & Rudy, 1997). By the end of the first quarter of the nineteenth century, the professor movement had produced a relatively large cohort of career college teachers (Finkelstein, 1997). The beginnings of departmental organization are easily discernible at both Harvard and the University of Virginia in the second quarter of the nineteenth century (Brubacher & Rudy, 1997). Administrative layers developed, beginning with departmental administration (Veysey, 1965). It was easier for a department chair to oversee the work of a specialist in his (or, rarely, her) department than for the university president to do so. As

departments became increasingly specialized, faculty service in support of the area of specialization (the discipline or department) became increasingly important, especially in areas tied directly to that expertise, most notably matters of curriculum (Cohen, 1998). The growth in size of universities, more than anything, led to the creation of the department chair position. The complexity of universities and discipline specializations created the need for leaders to drive the newly organized groups of faculty.

What are the characteristics that differentiate department chairs from other administrative positions in the university? The movement from multi-tasking presidents to specialized department chair leaders provided an opportunity for exploring this development. In a large, public university, the chair is an agent of faculty consensus (Mahoney, 1972). Chu offers that they are boundary spanners who work between the formal organization and each of the constituent groups surrounding the organization. Many chairs view themselves primarily as faculty serving a relatively short term, with the average being six years (Carroll, 1991, Seagren, Wheeler, Creswell, Miller, & Van Horn-Grassmeyer, 1994). Del Favero (2003) notes that faculty who assume administrative posts often lose touch with the daily realities of academic life. In a research university, it is the norm for a chair to return to a teaching and research position after three to five years, and so an individual must remain professionally active and current in the discipline during the period he or she is the department chair (Seagren, Creswell, & Wheeler, 1993). It is also the case that department chairs are typically not professional administrators, and unless their institutions have facilitated their participation in special training programs for higher education administrators, they must learn on the job (Bensimon, Ward, & Sanders, 2000). Transitioning into leadership requires understanding organizational nuances and being able to

build and sustain relationships (Wolverton, Gmelch, Montez, & Nies, 2001). The ideal chair in a state college has good character, an understanding and appreciation of the role of administration, the appropriate job and people skills, and outstanding professional ability (Heimler, 1972).

Bennett (1982) identifies three entities that compete for the chair's allegiance: the department, the institution, and the discipline. The chair does not exercise full power or entirely control the rewards in any of these entities but does exert significant influence on all three. This could lead to a belief that many department chairs are not totally invested or empowered to fully discharge their duties. The literature in this section proved to be incredibly useful as this research project moved forward. Many of the issues on which previous studies reported reemerged in my data. In fact, the previous findings were frequently at odds with the data produced in this research study. Having the historical perspective allowed a more comprehensive examination and solidified the need for this research study.

The literature shows that the department chairs role has not diminished or been diluted at all. Chairs' roles and responsibilities have been expanding over the last decade (Lucas, 2000). McLaughlin, Montgomery, and Malpass (1975) defined three dominant roles of the department chair: academic, administrative, and leadership. Different types of institutions place different demands on their chairs (Creswell et. al., 1990). Wheeler (1992) indicated that a department chair serves many roles including resource link, mentor, facilitator of mentor relationships, institutional authority or representative, evaluator, faculty developer, and a model of balance. Treadwell (1997) added that department chairs have broad roles that are unique including academic and administrative leader, resource acquisition and allocation, and constituent relationships/boundary spanning. Higgerson (1996) notes that virtually every task assigned to

department chairs requires effective communication skills. Carroll and Gmelch (1992) discovered four orientations in a factor analysis study of the duties of department chairs: leader chairs, scholar chairs, faculty developer chairs, and manager chairs. Creswell and Brown (1992) defined seven separate roles: provider and enabler (sub-divided as administrative), advocate (external), and mentor, encourager, collaborator, and challenger (interpersonal), which illustrates how chairs use the most appropriate role depending on the faculty member's career stage. Smart and Elton (1976) identified four roles: faculty, researcher, instructor, and coordinator. Booth (1982) also identified four distinctive roles: faculty centered, externally focused, program oriented, and management centered. Bragg (1981) listed four different orientations for chairs who serve at research universities: faculty chairs who focus on recruitment, support, and development of faculty; external chairs, whose primary responsibility is the promotion of the departmental image outside the department; program chairs who are primarily concerned with improvements in the curriculum; and management chairs who focus on coordinating the operations of the department. Becher and Kogan (1992) found that academic leaders have multiple roles because they operate within hierarchy and collegium at the same time. Henkel (2000) stressed that the ambiguities and uncertainty surrounding their objectives and missions, their lack of technical or interpersonal skills for the role, and the type of decisions they are asked to take and impose on their peers do not make their job any easier. The literature was rich and informative about the multiple roles and responsibilities of the department chair. In addition, the research has uncovered multiple traits that are valuable to anyone seeking the position. Clearly the complexity of the duties for a department chair has grown but what about their ability to implement change?

Chairs may have somewhat limited control over budgets, rewards, curriculum, and personnel matters depending on the structure of the institution. But chairs do exercise certain types of power. In fact, research from European studies has shown that the department chair has become more powerful. Bleiklie et al. (2000) notes that departments have seen their size and workloads increase and now have more authority. Johnson, Hanna, and Olcott (2003) note that the most important leadership in the academy emanates from the center, from those who serve as the chairpersons of academic departments. Bauer et al. (1999) opine that the 1993 reform of Swedish universities, aimed at decentralization and a stronger institutional identity for universities, helped to change the way in which university leaders see their mission and role. They also show that one of the unintended repercussions of the reform was to place the deans in a particularly strong position of authority, thereby strengthening the centrifugal tendencies of the faculties. To remedy this, university presidents have set up inter-faculty decision-making bodies and negotiate directly with department chairs. In addition, research in the U.S. offers a number of power models that department chairs can use to lead their units. Legitimate power, what Leslie (1973) would call “formal authority,” stems from the chair’s right to make decisions and to affect procedural issues such as the membership of committees. Chairs also enjoy an ability to frame issues to their advantage. They often have special knowledge about membership on committees and coalitions (Seagren, Creswell & Wheeler, 1993). In addition, chairs may be able to give rewards, such as merit pay, reappointment, promotion, and tenure. Beyond this power as Deetz (1992) notes, the chair has power to decide the teaching load that each faculty member will carry and how much money is in each category within the departmental budget. A legitimate amount of power does rest with the department chair and many aspects are not as clearly

identifiable as those listed on the official job description. This adds to the complexity of the department chair position.

Another important element that helped to shape this research study concerned the issue of department chair strategies used in building or changing a unit. Promotion and tenure decisions allow department chairs the opportunity to shape and control an unit. Seagren, Creswell, and Wheeler (1993) believe that evaluation [of faculty], the process of judging performance, is one of the most powerful opportunities for development available to a department chair. Tucker (1984) notes that probably no other activity has more potential for strengthening or weakening a department over a period of years [than faculty evaluation]. The department chair must have a comprehensive understanding of the subtleties of the tenure process at all levels of the institution and be willing to relay that knowledge to all new faculty (Bensimon, Ward & Sanders, 2000). The literature does not reveal the availability of training on this important process for department chairs. Nor does it discuss the equally important issue that emerged from my research study, namely the ability of department chairs in highly diversified departments like the life sciences to recognize quality in the various sub-disciplines.

In order to better understand the role of the department chair, it is important to explore the various difficulties that may be experienced by individuals who serve in that position. Edwards (1999) lists lack of training as one of the most important and problematic characteristics of department chairs. The issue is perhaps not just training itself but the implications: the untrained “peer” chair belongs to the collegial culture; training implies more of the managerial culture (Bergquist, 1992). Chairs must be active in identifying and addressing their own professional development (Seagren, Creswell & Wheeler, 1993). Too often the daily

pressure of responsibilities takes precedence and personal and professional development falls towards the bottom of the list. Chairs should build an agenda to continue to grow and develop just as they encourage their faculty to develop. The literature on chairs' development consistently cites the need for improvement of negotiation and conflict-resolution skills (Bennett, 1983, Tucker, 1984). Department chairs who participated in a national study identified the need for training on how to evaluate faculty performance, encourage professional development activities of faculty, and recruit and select faculty as a high priority (Gmelch et. al., 1992). Howard and Green (1999) conclude that all chairs learn their new duties as they go but simply learning on the job is not enough. The literature indicates that more training would be beneficial and may even encourage more candidates to emerge and accept the department chair leadership position.

It has been noted several times in the previous paragraphs that a department chair is challenged by a multiplicity of complex tasks. Can this situation effect the leadership abilities of department chairs? Dill's review of the literature (1984) found that the amount of time spent on duties as a chair is a major source of stress for department heads. In a study on the stress experienced by department chairs, Wolverton, Gmelch, Wolverton and Sarros (1999) note that when left unchecked and undirected, psychological, emotional, and physical maladies hamstring department chairs, their work units, the department, and the university itself. Gmelch and Burns (1993) identified three particular areas of stress for department chairs, namely, time pressures, confrontation with colleagues, and organizational constraints. The literature does not discuss how this stress impacts the other responsibilities than many department chairs experience in

relation to their faculty duties and personal lives. The material here was useful in framing questions for the interview protocol used for the department chair interviews.

What are today's universities providing in the form of training and preparation for individuals who fill the department chair role? The leadership role of a department chair often gets summarily ignored (Gmelch & Miskin, 1995; Keller, 1983; Tucker & Bryan, 1988). Many universities invest in training their department chairs, but too often it remains sporadic and narrowly focused on fiscal and reporting responsibilities. The obvious solution is to strengthen chair leadership preparation through more consistent development opportunities (Edwards, 1999). A less obvious solution is restructuring the position. Under this scenario, deans help chairs delineate between the work that must be done *within* the department and work which can be done *for* the department. Deans can also strengthen the competencies of the support staff assigned to a department through selection, evaluation, and training. Large departments may run more efficiently with an assistant to the chair, an associate chair, or a department coordinator to carry part of the daily work load (McAdams, 1997). The fact that only a few models exist to alleviate many of the obstacles encountered by department chairs suggests that deans and provosts must be exposed to this informative literature and be willing to look for new methods to prepare department chairs for their complex roles. It is also important to note that this literature provides a broad foundation from which to build. The research study will certainly add to the research results in this area. By taking a focused look at a specific area within the university, we will begin to further understand the complexities of this important leadership position.

Leadership and Mentoring of Faculty by Department Chairs

Accessing the literature available on the operations of academic departments proved to be fruitful. Many researchers have focused their attention on the important link that departments represent in the structure of higher education institutions. The initial material provided information on organizational change at the department level.

What is the contribution of departments to the overall mission of the higher education institution? Academic departments are crucial to all the core functions of a college or university—teaching, research, and service (Klein, 1985, Pascarella & Terenzini, 1991, Volkwein & Carbone, 1994, Willcoxson & Walter, 1995). Zemsky (1995) adds, “We are not going to restructure, reconfigure, re-anything this enterprise if we don’t do it at the department level.” Gmelch and Miskin (1995) report that deliberate and careful selection of new colleagues has more to do with the growth and well-being of your department than any other action you may take. Wolverton et al. (1999) state that in a dynamic environment subject to rapid demographic shifts, financial uncertainty and increased calls for accountability, chairs play a crucial role in ensuring program and institutional viability. To achieve this change, reformers have suggested that departments undergo program review (Mets, 1995), assess student learning (Banta, Lund, Black & Oblander, 1996), or become more responsible for their own financial bottom line (Adams, 1997, Whalen, 1991). In a survey, 37 provosts from public land-grant universities most frequently replied that they wanted departments to be more interdisciplinary, entrepreneurial, and collaborative and the number one expectation was for stronger leadership at the chair’s level (Edwards, 1999). The point is clear in light of this literature that department chair leadership is crucial when institutions embark on reorganization, strategic planning or accountability projects.

The right type of leadership is critical for departmental effectiveness and change. Strong leadership has been found to be a crucial factor in the high morale of 10 outstanding colleges (Rise & Austin, 1988). Kozma's study (1985) of Exxon- and National Science Foundation-funded projects for instructional innovation demonstrated that the role of the chair was crucial in achieving the project's goals. Faculty development leaders (Wright, 1994) and provosts (Edwards, 1999) in surveys strongly agree on the importance of departmental leadership. The Pew Higher Education Roundtable has cited strengthening the role of the chair as one of the four steps needed to help departments meet the challenges of the changing environment (Zemsky, 1996). Bensimon et al. (2000) note that studies have suggested that intellectual, social, and resource support from chairs are critical to the success of new faculty and report that findings point to the essential, pivotal role played by department chairs. Hill and French (1967) conducted work that offer the counter argument that shows the correlation between administrative leadership and faculty publications is zero, even negative. Blackburn and Lawrence (1995) report that some faculty do not see the chair as having anything to do with their research success. The majority of material on the importance of department chair leadership emphasized the need for a strong leader who is empowered to make decisions in order for the academic unit to be successful. The results of this examination seem to indicate that this project will add to the growing discussion about the value of department chair leadership, at least as it pertains to departments of biological sciences.

The natural progression, then, is to determine if researchers have discovered what department chairs can do to impact faculty productivity. It is important to focus on material that is specific to the operations of academic departments. As an alternative to the functionalist

perspective, which assumes that managers can manipulate toward desired ends, recent theorists have emphasized that peoples' values, perceptions, personal qualities, symbols and myths, and models of leadership all help to construct what they think a good leader is and how they influence, interpret, and respond to the actions of the leaders (Bensimon & Neumann, 1993, Neumann & Larson, 1997, Deetz, 1992, Dill, 1984, Lueddeke, 1999). Mitchell's study (1987) of 19 outstanding chairs at three universities in the Midwest found that effective leadership depended on the congruent integration among leaders' values and management strategies, values of the faculty and administration, control over resources, and the department's stage of development. Thus, in times of change, departmental notions of leadership may themselves be changing and may affect change. The opportunities for more research is clearly evident here. A better understanding of the characteristics important for good university leadership would be beneficial to the field and for general practice.

The review now continues in the area of mentoring approaches used by department chairs especially with new faculty hires. This topic is important in the main but extremely significant to this specific research project. In a joint report issued in 2000 by the American Council on Education, American Association of University Professors, and United Educators Insurance Risk Retention Group, several strategies are listed as "good practice" for department chairs to use when evaluating and mentoring new faculty. Among the items listed, the most relevant for this study were:

- 1) Department chairs and other responsible administrators should clearly communicate all criteria, including any special requirements applicable within a department or a college, to a tenure-track faculty member early in his or her career at the institution;

- 2) Department chairs and other colleagues should not convey excessive optimism about a candidate's prospects for tenure;
- 3) The department chair or other responsible administrator should clearly explain to every tenure-track faculty member the standards for reappointment and tenure and the cycle of evaluations of his or her progress in meeting these requirements;
- 4) The institution should conduct workshops for department chairs on the appointment and evaluation of tenure-track faculty.

Recent trends suggest that many tenure track positions are being replaced with non-tenure track hires. This presents special problems for department chairs in the areas of loyalty, collegiality, and department hierarchy. Universities can be and all too often are atomizing, disassociative institutions that feed off of graduate assistants, untenured faculty members, and tenure-track faculty members (Boice, 1992). As institutions of higher education are continually challenged to confront the growing attrition of non-tenured faculty resulting from overbearing workloads, job dissatisfaction (see Gilbert, et.al., 1997; McLeod, 1999) and competitive job markets, it becomes imperative that a broad range of strategies be explored. The observation in this situation is that there is a good opportunity for more research on the subject of faculty in non-tenure roles.

Turning to the topic of mentoring will allow an exploration of the main types and the new models that have emerged. Mentoring, as a subject matter, has evolved into almost a generic term that can be "self-defined" by people. The mentoring focus here is related to formalized actions undertaken in academic settings with outcomes related to research and scholarly productivity.

Over the last three decades, interest in mentoring and attempts to implement successful mentoring programs have increased throughout higher education (Angelique, Kyle, & Taylor, 2002). Mentoring programs in higher education have met with mixed success. Though not all identical, such programs are based on the premise that more experienced faculty will assist, guide, and support the new and non-tenured faculty through the murky and sometimes treacherous waters leading to tenure (Daloz, 1999; Jacobi, 1991). Mentoring in its traditional form can be problematic (Darwin, 2000; Powell, 1999). There is an assumption that colleagues of equal stature will work in each other's best interest regardless of the competitive culture that often exists in higher education institutions (Stalker, 1994). Traditional mentoring reflects the prototypical relationship, as described in Homer's *The Odyssey*, where Athena (disguised as Mentor), at the bequest of Odysseus, serves as a model, advisor, and teacher to Telemachus, his disciple and student (Carden, 1990, Daloz, 1999; Galbraith & Cohen, 1995). Characteristically, mentoring in this form involves a one-to-one, uni-directional, asymmetrical relationship in which a junior and less experienced individual is paired with an experienced person with intent to receive guidance and support (Blackwell, 1989). Jacobi (1991) identified roles that mentors play in their relationship to mentees. They included providing acceptance and support, dispensing advice and guidance, coaching in the ways of the institution, imparting important and sometimes privileged information, offering visibility and exposure, and extending protection—just to mention a few. Stalker (1994) identifies three reciprocal outcomes based on a review of the literature, including career advancement, personal development, and professional identification. Both the mentor and mentee should prosper and grow from the interchange of the mentoring

relationship (Cohen, 1995; Daloz, 1999; Wright & Wright, 1987). Critical appraisal suggests problems inherent in this model (Darwin, 2000; Powell, 1999).

Traditional mentoring is an androcentric process that reproduces “an unavoidable homogeneity and sameness on those within the institution” (Stalker, 1994, p. 367). Traditional mentoring has an exploitative potential, where the mentor can take advantage of the mentee through unrealistic expectations, excessive demands for time, and even inappropriate sexual intimacy (Phillips-Jones, 1982). It is a process that sanctions an elitist patron system, whereby the academically marginalized (marked by age, race, gender, ethnicity, sexuality) are often excluded and/or limited in their access to appropriate mentors (Bogat & Redner, 1985; Noe, 1988; Powell, 1999; Stalker, 1994).

Peer mentoring, sometimes referred to as peer coaching (e.g., Anastos & Ancowitz, 1987, Sparks & Bruder, 1987) or sometimes as just peer relationships (e.g., Kram & Isabella, 1985) can be thought of as an alternative to traditional mentoring. Peer mentoring is said to promote career enhancement and psycho social well-being (Campbell, Angelique, Bootsmiller, & Davidson, 2000). Peer mentoring promotes information sharing, career planning, and job related feedback. “Through [the] sharing [of] perceptions, values, and beliefs related to their lives at work and through discovering important commonalities in their viewpoints” peers are able to provide confirmation for one another (Kram & Isabella, 1985, p. 118). Peer mentoring may still become hierarchical because of the inherent competitive nature of the institution (Angelique, Kyle, & Taylor, 2002). In essence, both traditional and peer mentoring are couched within notions of professional guidance that strive for sameness and homogeneity within the institution. Each

model promotes complicity in the “competition for recognition of publications, research, scholarship, teaching, influence and power” (Stalker, 1994, p. 367).

Another alternative to traditional mentoring has recently emerged. New Scholars Network (NSN) is a variant of traditional mentoring approaches, having evolved from mentoring into musing. Framed within a radical humanist philosophy, musing is a process of creating peer communities that facilitates connections between naturally developing relationships, shared power, and collective action. Through mentoring as musing new faculty have the potential to evolve as change agents in the institution, instead of assimilating into the existing system.

The literature on mentoring in its various forms was instructive on several fronts. It allowed me to formulate several questions for my interview protocol. It also informed me that I should talk to both department chairs and new faculty hires to discern what mentoring means in each situation.

Faculty Roles, Expectations, Motivations, Rewards, and Productivity

Why are certain people motivated to enter the academic field as educators and researchers in the university setting? The relationship between the faculty and their department chairs seems to be a key component to understanding how and why they are motivated to become productive and active researchers and teachers.

Employee motivation data was first explored in a corporate setting. More recently, the focus has been aimed at the university setting. Understanding how faculty perceive the integration of their personal values, needs, and attributes within institutional contexts is essential because these perceptions contribute to "sense-making," a set of linked, although conceptually distinct, processes that include cognitive, behavioral, and social elements (Morgan, Frost, &

Pondy, 1983; Trice & Beyer, 1993). Sense-making contributes fundamentally to the formation of perceptions of meaning associated with one's work role and, ultimately, influences the nature and intensity of individual motivation (Maehr & Braskamp, 1986). Over time, perceptions of meaning affect people's work-related processes and outcomes, including their job satisfaction, commitment, and performance levels. Studies of alignment of individual's values and perceptions of their work environments indicate that congruence is associated with outcomes that every academic administrator wishes upon his or her organization: increased job satisfaction, lower attrition, better job performance, and a strengthened commitment to the organization (Chatman, 1991; Chatman & Barsade, 1995; O'Reilly, Chatman, & Caldwell, 1991; Verquer, Beeher, & Wagner, 2002). The review of this literature revealed an important component for this study, mainly that many faculty have a complex set of processes that combine to form the basis of what motivates them.

The vision for higher education that has emerged in the last two decades revolves around the institution as a driver of economic development for the surrounding area, state and nation. The realization of this expectation ultimately relies on the actions and productivity of the university faculty. The possibility that universities and other educational and research institutions could play an important role in promoting economic development was not lost on nineteenth century policymakers (Mazzoleni, 2004). While the expectations are not new, the subject as an area of study is fairly new and will be explored more fully in this section. As the changing nature of funding put pressure on universities to generate more revenue, faculty became involved in academic capitalism in every aspect of their tripartite role: teaching, research, and service (Slaughter & Leslie, 2000). One of the concerns, as higher education

institutions are pushed by strong external pressures, is that faculty members will lose some of their autonomy and voice in determining how their work is organized and for whom (Austin, 2002). Rhoades (1998) adds that faculty are increasingly managed professionals. Some institutions are urging their faculty members and departments to become more entrepreneurial, and some faculty members and departments are entering new kinds of relationships with corporations for research funding, such as the Novartis agreement with the University of California at Berkeley (Blumenstyk, 1998). Faculty members need to understand the issues and implications as higher education institutions interact in new ways with other sectors, so that they can make informed decisions about their own work.

Much of the literature on faculty motivation suggests that individuals are attracted to academe because of the level of autonomy afforded by the university setting (Henkel, 2000). A key factor in ensuring that faculty members retain their power and autonomy regarding their individual work and their influence on the directions of their institutions is the degree to which faculty members understand how to enact their roles as institutional citizens (Burgan, 2001). As Gaff and Weibl (1998) point out, autonomy is accompanied by responsibilities. Graduate students and new faculty members need to learn about the history of faculty involvement in institutional governance, the philosophical and practical reasons that institutional leadership responsibilities should be undertaken, and the skills required to engage in this kind of work (Austin, 2002). The reading here convinced me that I had chosen the right area to focus my gaze—namely biological sciences. The deals referred to by some of the authors are occurring overwhelmingly in the life sciences with faculty who are working on solutions to some of society's most compelling health problems. But what can a department chair do to maintain the

level of autonomy that is expected by faculty members, while encouraging the deal-flow between the university and the corporate world? It will be interesting to see if any of the department chairs have discovered a method that encourages both autonomy and economic development.

Turning to the topic of faculty expectations will add another layer to this study. In the AAHE-sponsored "Heeding New Voices" study (2000), early-career faculty report that they want to do good work and are willing to work very hard, but they are worried that expectations within their departments and institutions are not stated openly or explicitly. As one faculty member explained: "Everything is so vague, ambiguous, and elusive; expectations are changing all the time" (Rice, Sorcinelli, & Austin, 2000, p. 10). A substantial amount of research concurs that promotion and tenure are often elusive, unpredictable, and fraught with conflicting expectations and unwritten rules (Rice, Sorcinelli, & Austin, 2000). Faculty struggles with promotion and tenure are attributed to ambiguous and often contradictory criteria. Conflicts between institutional rhetoric and the realities of reward structures, and the emphasis on research to the detriment of teaching and service in promotion and tenure decisions have been identified as major sources of stress and dissatisfaction in probationary faculty (Gmelch, Lovrich, & Wilkie, 1986; Rice, Sorcinelli & Austin, 2000; Sorcinelli, 1992; Tierney & Bensimon, 1996). O'Meara's (2002) findings suggest that many faculty hold values and beliefs about service scholarship that doubt and devalue its scholarly nature, purpose, and products. Other scholars have noted an ambiguity, lack of readiness, and resistance to assessing, rewarding, and valuing teaching scholarship (Brand, 2000). Boyer's (1990) framework for expanding the definition of scholarship was an attempt to mute the trend toward valuing traditional research exclusively by

making multiple forms of scholarship visible and by elevating their status within the reward system. This is especially important at research universities, which offer greater opportunities for role specialization than do institutions with more narrowly focused missions (Serow et al., 2002). While my focus is strictly on research productivity, which includes scholarly publishing, it will be interesting to see if the department chair and the new faculty hires have different views about the importance of research productivity and how it relates to promotion and tenure. I have also included a question or two in my interview protocol that addresses this issue, specifically on how the department chairs guide new faculty hires down the path to tenure.

There is more literature on faculty expectations that deals specifically with rewards. Asking faculty to do one thing and be rewarded for another is dysfunctional for individuals and for institutions (Checkoway, 2001). New faculty are entering a market that requires them to balance a variety of academic roles if they are to become successful and ultimately obtain tenure (Massy & Wilger, 1995). Unfortunately, many of these individuals do not have realistic views of what the faculty role actually entails prior to their employment (Gaff & Lambert, 1996). Slaughter and Leslie (2000) claim that faculty are pushed and pulled to win grants, to patent and, more recently, to copyright, and to share these revenues with the colleges and universities for which they work. We know that research is the most rewarded of all faculty activities regardless of institutional type and it is also a great source of stress for junior faculty (Bensimon, Ward, & Sanders, 2000). In the university context, faculty who perceive themselves to be at odds with their department or institution's perceived organizational culture indicate higher levels of job-related stress, report less overall satisfaction with their positions, and spend less time on teaching (Blackburn & Lawrence, 1995; Fairweather & Rhoads, 1995; Olsen, Maple, & Stage, 1995;

Peters & Mayfield, 1982). In order to alleviate some of this stress and confusion, many universities have begun to pair junior faculty with senior mentors or to offer regular seminars and workshops on instructional topics, patent and copyrighting issues, research resources, time management, grant writing, and entrepreneurship. Department chairs can help with the transition to the new position by clearly articulating expectations for research at the institution and in the department, and by simply talking to the new faculty member about research and developing a research agenda (Bensimon, Ward, & Sanders, 2000). Another solution offered by social network theorists finds that those who have direct contact with peers are more likely to gain an understanding of others beliefs and behaviors and, therefore, come to agreement with them (Erickson, 1988; Gatrell, 1987; Marsden & Friedkin, 1994; Poole & McPhee, 1983; Singer, 1980). Research on faculty productivity suggests that unless faculty establish productive scholarly habits within the first five years of a junior faculty member's appointment, they are unlikely to be developed later (Bland & Schmitz, 1986). Fink (1984) has shown that after their first year, two-thirds of faculty indicated that they wished they could have had a better orientation at the beginning of the year to provide information to questions they had, as well as answers to some questions they did not even know they should ask. Bensimon, Ward and Sanders (2000) conclude that junior faculty socialization must be deliberate—department chairs cannot just rely on people getting along or on the faculty member knowing what questions to ask. The literature is very straightforward that clearly delineated expectations that match the organization's real culture will aid faculty development and productivity.

Olsen and Crawford (1998) discovered in a five-year study they conducted that they see junior faculty who are asked to take on inappropriate service commitments or unusually heavy

teaching loads, or who are simply left alone to discover their own career path through a process of trial and error to be at a clear disadvantage. Huber (2000) adds that faculty are frequently made to compete with colleagues in other departments for funding both for operations and professorial positions. While the idealized scholar spends time gathering data, pouring over journals in conducting research, writing drafts to synthesize new insights, preparing lectures, and educating students with pithy phrases or oratorical flourishes, wry anecdotes, or germane examples, the faculty member actually spends considerable time sitting in committee meetings, answering e-mail queries from students and colleagues, scheduling lecture series and conferences, reviewing articles for journals, and advising student groups (ASHE-ERIC, 2002). This second group of activities, which falls under the rubric of service to the discipline and campus, are part of the hidden curriculum of faculty life. Even at research universities, some academics focus almost exclusively on instruction, while the majority distribute their working hours across teaching, research, and service (Altbach & Lewis, 1996).

The evaluation of the productivity of a faculty member is an important aspect for informing expectations. Creswell (1985) notes that annual or semiannual performance evaluations influence the decisions or recommendations that chairs make about promotion, tenure, merit pay, special graduate standing, and contract renewal. Tien and Blackburn (1993) learned that faculty publication rates rise as promotion time approaches. Boice (1992) found that unproductive faculty tend to attribute their poor performance to lack of time, that they must have large chunks of time to write. Most of the literature here provides solid arguments for the need for this type of study. Allowing the department chairs to explain their positions in their own voice and having the counter-balance of the new faculty hire's opinions will bring this topic into

clearer focus. While the various quantitative studies have given us an idea about what problems exist, I feel this qualitative study will enhance our understanding of the relationships between department chairs and new faculty hires in several biological science departments.

Although the more recent trend toward faculty evaluation has used the motivation models from the corporate world, newer research reveals that this may be inappropriate. Studies by organizations such as Gartner on motivation of knowledge workers, the most appropriate sector in which to include faculty, reveal that if organizations are to capture knowledge workers they need to provide differently framed remuneration and performance packages. While competitive pay rates are important, they represent a hygiene factor (Herzberg et al., 1959) rather than the differentiating element in what has until recently been styled as the war for talent. More importantly, knowledge workers are motivated by the inherent stimulation of the work itself and value a capacity to finish the task, autonomy in task, and to work with interesting individuals (McInnis, 2000; Morello, 2000). These then are the sources of motivation for knowledge workers/academics, health professionals, lawyers, and the growing ranks of professional workers. Dunkin (2003) adds that it has long been understood in universities that academics are less motivated by absolute pay than by access to research time, resources, and students. More than most professionals, academics are said to place a premium on the chance to do work in which they believe (Serow et al., 2002). Blackburn and Lawrence (1995) add that being in an environment where scholarly activity abounds not only sharpens research skills but also motivates one to engage in creative work. Slack's (2004) research validates this idea and found that the leading predictors of faculty productivity included location in a research university and effort (hours worked). Traditional schemes for sabbatical leave recognized that creativity and

research need release from operational requirements and time to reflect (Amabile et al., 2002). In addition, the structure of the higher education system in the United States has allowed for a diversity of institutions and the size of the higher education sector has allowed for differentiation by academics which allows scholars to find their niche among the choices (Dunkin, 2003). Universities should reflect on the changing nature of their work, the contributions their faculty make to that work and the international labor markets in which they operate (Nowotny et al., 2001). The literature in this section was fascinating to me. I had suspected that there were different motivations for people that choose to be faculty but the studies clearly illustrate the differences. I wonder if that aspect will emerge from this study?

Research Funding and Impact on the Institution

The importance of the literature review on this topic cannot be overestimated. The research question focuses the bright light of attention on the idea that research productivity is a positive activity and much time and energy is spent trying to assist faculty in their pursuit of funding for their projects. It is even more important to recognize that the successful procurement of research funding enhances the faculty's reputation and in turn the reputation of their home institution. It is important then to take a focused and studied look at the material written on this topic. In addition, I turned to the issue of teaching versus research as a consequence of the main topic. While experience illustrates that we are trained to be researchers, if we pursue doctoral studies at a research extensive institutions, are teaching skills assumed to be inherent for those who aspire to faculty positions? Do institutions have the resources to deliver high quality teaching while providing the best research environment for its faculty?

Senior academics often contend that the mutually reinforcing, symbiotic relation between teaching and research is what distinguished universities from other research and educational institutions (Neumann, 1992). Most of the current literature addressing the topic of the effects of research on teaching quality gives conflicting views. At one end is the perspective that there is either no correlation or a slight positive correlation between research activity and teaching effectiveness (Feldman, 1987). On the other hand, at the institutional level, a heavy emphasis on research negatively affects the emphasis on teaching (Astin, 1993). Hattie and Marsh (1996) performed a meta analysis on this relationship and found evidence that suggests that time on teaching and time on research are negatively correlated. They concluded that there is a tension between the time devoted to the two activities, but this tension may not be translated into differential outcomes. Other inquiries have probed the statistical relationship between instructional effectiveness and research productivity (Braxton, 1996; Feldman, 1987). The general assumption is that these studies present both a good news and bad news scenario. Many attempts have been made to account for the relation between teaching and research and studies have assumed the nature of this relation and characterized it as one that exists between externally defined indicators such as teaching effectiveness and research productivity (Robertson & Bond, 2001). Harry and Goldner (1972) reported that incremental increases in time for scholarly activity appear to reduce teaching time only slightly. Marsh and Hattie (2002) note that those who spend more time on research do have higher research outcomes, but those who spend more time on teaching do not seem to be more effective teachers.

There appears to be a natural tension between research and teaching faculty and each side has become more vocal in support of their ideology. Wankat (2002) notes that professors can be

both great researchers and great teachers, but few institutions have the resources to invest so that faculty can be great at both. Teachers who are active researchers are more likely to be on the cutting edge of their discipline and aware of international perspectives in their fields (Marsh & Hattie, 2002). Tierney (1998) notes that at many colleges and universities, the rewards for research have become considerably greater than those for other activities. The preferred appointees are those who “want to do research on their own projects at convenient times under productive conditions for national and international recognition” (Huber, 1992, p. 5; see also Smith, 1990). The data show that active scholars/grantspersons are more likely to spend time on the preparation of proposals than on other research activities (Blackburn & Lawrence, 1995). Sullivan (1996) emphasized that academic staff, even those who are the most productive researchers, support normative structures that place a high value on teaching effectiveness. Boice (1992) found that some veteran teaching faculty were not only non-researchers themselves but actively opposed the research efforts of their younger peers. A study of faculty in 11 research and doctoral institutions in 1991 and 1996 found that faculty felt they attributed more importance to teaching than did their departmental colleagues, chairs, deans, and central administrators (Diamond & Adam, 1997). One suggestion to counteract this occurrence is to “hold the department collectively responsible” (Walvoord, Carey, Smith, Soled, Way, & Zorn, 2000) so that if the department wishes to gain resources or increase opportunities for raises, there is a collegial agreement for this mission. Perhaps it is impossible to resolve the differences between researchers and teachers and that tension may be healthy for the institutions.

A closer look at the teaching obligations of faculty may help to illuminate how to facilitate better training methods for faculty who teach. Middaugh (2004) notes that faculty

activity, such as academic advising, curriculum reform, publishing, commissioned shows and performances, professional development activity, and public and institutional service, are expected of faculty and crucial to academic life at a college or university but all occupy time that could be spent on classroom instruction. Blackburn (1974) noted that unsatisfactory classroom performance might result from academics neglecting their teaching responsibilities in order to pursue research and publications. The time and energy required to pursue research is limited by the time demands of teaching and vice-versa (March, 1987). Another report from a research university's economics department decimated over their faculty's disagreement about the priority that teaching should hold in the department indicates that collegial alignment is fundamental to an organizations's long-term survival (Wilson, 2002). Sample (1972) argued that there is an inherent conflict between teaching and research, because effective researchers must be highly specialized, whereas effective teachers must be very broad. Superior faculty may well do research and teach better than inferior faculty, but they might teach even better if they did no or less research (Black, 1972). Marsh and Hattie (2002) wrote that academics receive considerable training in how to be productive researchers and are constantly exposed—through professional reading, conferences, and collaboration—to role models who are productive researchers. They concluded that because academics know how to be productive researchers, it follows that greater motivation, time, effort, and appropriate activities should result in increased research productivity. In contrast, most academics receive little or no training in how to be effective teachers and are rarely exposed to role models who demonstrate effective teaching.

Does the current reward system favor faculty who are productive researchers?

Fairweather (1996) and Hearn (1999) both found evidence showing that promotion, tenure, and

merit pay are more closely tied to research productivity than to teaching and its associated tasks. Zemsky and Massey (1990) offered the idea of “the academic ratchet” which is defined as the advance of an entrepreneurial spirit among faculty nationwide, leading to an increased emphasis on research and publication, and on teaching one’s speciality in favor of general introduction courses, often at the expense of coherence in an academic curriculum. They concluded that institutions seeking to enhance their own prestige may contribute to the ratchet by reducing faculty teaching and advising responsibilities across the board, thus enabling faculty to pursue their individual research and publication with fewer distractions. Blackburn and Lawrence (1995) also found that a research university’s institutional prestige inextricably depends on faculty research accomplishments and that universities design their faculty selection and promotion processes to recruit and retain productive scholars. The reward systems provide ongoing incentives for faculty members to conduct research (Blau, 1973; Long & McGinnis, 1981). Marsh and Hattie (2002) explain that if universities want to improve their research productivity, they need to select, retain, promote, and support academics who are good researchers.

What about the influence of industrial partners? Blumenthal, Campbell, Causino, and Louis (1996) discovered that faculty members with industrial research support are at least as productive academically as those without such support and are more productive commercially. However, they also concluded that faculty members who have research relationships with industry are more likely to restrict their communication with colleagues, and high levels of industrial support may be associated with less academic activity without evidence of proportional increases in commercial productivity. Pfeffer and Salancik (1974) found that

faculties benefitting from external support (e.g. great scientific reputation, funding from outside partners, privileged relationship with national authorities) were very likely to win internal bargaining processes. Guterman (2005) asserts that having industry on their side also helps universities speak with a stronger voice in Washington.

The existing literature creates a paradox. Some would have us believe that the cohabitation of research and teaching is impossible. Others report that the two activities are at odds with each other while some say the statistical analysis shows correlations. What I noticed most significantly is that the current research lacks input from the qualitative researchers. The stories of the faculty and department chairs who are actively pursuing research excellence should provide valuable information that will be useful for this debate. Exposing the human aspect of this puzzle will be one outcome of this study.

External Forces Impacting Higher Education

While this study focuses on faculty productivity and how that is influenced by department chair leadership, institutions of higher education are effected by internal as well as external influences. The internal concerns have been addressed elsewhere but this section will focus on the external forces. Colleges and universities do not operate in a vacuum. Public institutions receive additional scrutiny as opposed to private institutions because of the oversight by numerous entities including federal and state governments, higher education commissions and boards, student and parent groups, accreditation boards, alumni and the general tax-paying public. All of these groups have a vested interest in higher education and this creates an environment of competing expectations. Department chairs and the faculty they lead are impacted by all of this activity but some groups have more influence than others.

As tax revenue shrinks in the various state coffers, elected officials have become more open to applying business tactics to governmental enterprises. Lyall and Sell (2005) report that public investment in public higher education has dropped from about 50 percent in the 1970s to around 30 percent on average nationally today, without public knowledge or public discussion. Newman, Couturier, and Scurry (2004) write about the growing willingness on the part of political leaders to use market forces as a means of structuring higher education in order to increase the impact of the competition. Increasingly, the call for faculty workload studies are coming from state legislatures (Hines & Higham, 1996) with growing tensions between states and their higher education sectors. The idea of systematic accountability has received public favor and legislators have been quick to demand it of fairly unique operations like those in our colleges and universities. More than ever, external constituencies (e.g. policy makers, public) are continuing to demand more, not less, institutional accountability for the productivity and workload of the faculty through measurable outcomes (Rosser, 2005). In 2001, the Nelson A. Rockefeller Institute of Government found that 39 states required periodic reporting on the performance of colleges and universities, up from just 30 states in 2000 (Newman & Couturier, 2002). Skepticism as to the societal value and a general sense of distrust about spending practices and educational outcomes have affected the availability of resources to expand programs demanded by the increasingly diverse populations served (Wolverton, Gmelch, Montez, & Nies, 2001).

An in depth look at the topic of faculty productivity reveals the mood of the policy makers. The first visible wave of national concern over productivity and accountability in higher education took the form of an ill-conceived mandate within the Higher Education

Reauthorization Act of 1992 (Middaugh, 2001). Although later rescinded, the first steps were taken in 1996 toward “appropriately focusing” (Middaugh, 2001) the discussion on accountability and productivity in higher education. The Federal Higher Education Reauthorization Act of 1998 mandated that a study of fiscal stewardship in higher education be undertaken, and that instructional expenditures be a focus of analysis (Middaugh & Isaacs, 2003). The Joint Commission on Accountability Reporting (JCAR) was created by the American Association of State Colleges and Universities, the National Association of State Universities and Land Grant Colleges, and the American Association of Community Colleges in 1994. JCAR appointed a series of technical work groups comprised of faculty, institutional research professionals, and senior administrators in the areas of higher education management to analyze the current process of reporting. Middaugh (2001) recommends the conventions developed in the JCAR group which make it possible to tie the time that faculty spend in teaching activity to student outcome measures such as graduation and placement rates, licensor pass rates, and graduate school admissions. The author claims that this is the first nationally standardized output measures of faculty activity and the system is comprehensible to the non academic. He also notes that the JCAR conventions do, indeed, speak to the issue of which faculty types are teaching students and does so using an analytical strategy adapted from the Delaware Study. The study is a tool designed to help an institution determine how it is using personnel and fiscal resources and how that use compares with benchmarks for appropriate institutional peer groups (Middaugh, 2001).

Burke and Minassians write that by the fall of 2004, 44 states will have initiated some form of accountability mandates—including, in some states, reports on faculty activity,

legislation, and governing board requirements. Struggling hard to make ends meet, institutional leaders meanwhile are in growing rebellion against what they perceive as overly bureaucratic approaches to achieving accountability and regard them as complex, overlapping, and duplicative systems of reporting and assessment that are unnecessarily expensive in terms of time and resources (Leveille, 2005). The truly interesting aspect of this information is the lack of focus on research productivity. Arguably the research funding and potential outcomes from the biological sciences (cures, antidotes, drugs, medical devices) can all be sources of new income to institutions, yet most of the literature ignores the topic.

In demonstrating a reluctance to tax ourselves at high enough levels to adequately support higher education, citizens may have signaled a change in the importance they place on the benefits a college may bring to the state or region. Higher education is increasingly viewed as a private good that should be paid for by those individuals who directly benefit from it (Marcus, 1997). Bok (2003) notes that a lack of clarity about academic values opened the door even wider, fueled by keener competition and the rapid growth of money-making opportunities provided by a more technologically sophisticated knowledge-based economy. Proponents of this new understanding of higher education suggest that any public good derived from higher education will survive because of the actions of individuals (Cohen & Geske, 1990; Mortenson, 1994). Changing priorities at local, state, and federal levels and the impetus to reduce tax burdens have led governments to redirect expenditures from the creation of social capital to those initiatives that provide more immediate economic development and employment growth (Feeney, Mumpower, & Santiago, 2004).

The resulting decrease in funding experienced by many universities makes infrastructure and capital upkeep fiscally debilitating (Association of Governing Boards of Universities and Colleges, 1996). Industry sponsored R&D at universities, although considerably smaller in overall terms compared to federal sources, nonetheless is the fastest growing source of R&D funding for university research (National Science Board, 1998). All of which brings us to the topic at hand. Namely, that academic chairs play a dual role of fund-raiser and faculty advocate and must strike a balance between corporate expectations for the development of vocational skills and faculty beliefs that education embraces more than skills (Wolverton, Gmelch, Montez, & Nies, 2001). The existing literature provides some insight into the residual benefits of research funding but does not look specifically at the biological sciences. Higher education's growing dependency on federal R&D funds may foretell a growing problem for institutions that are unable to compete for this funding. Guterman (2005) says that a worsening economy has gutted state-government and university budgets, causing some institutions to shutter and others to close departments and schools. Many of the answers will be provided by tax elections around the country in the coming years.

The effectiveness of institutional and state policies meant to promote postsecondary teaching and learning in colleges and universities is open to question. Although we can point to some individual institutional success stories, recent national survey data suggest that faculty time devoted to research across all types of institutions has increased while time spent on teaching and administration has decreased (Fairweather & Beach, 2002). Simultaneously, the percentage of all faculty members who believe that teaching should be the primary factor in promotion and tenure has declined (Finkelstein, Seal, & Schuster, 1998). Diamond (1999) found that the value

of research productivity in faculty rewards remains high despite institutional policies to promote better teaching. Colbeck, Salerno, and Moran (1998) and Colbeck (2002) found little evidence that state policies affect faculty work directly or even indirectly. State funding agents have increasingly used performance- or incentive-based budgeting to encourage institutions to pursue state-identified goals (Lasher & Greene, 1993). While this budgeting approach has critics, it seems to increase attention to program assessment, economic growth needs, minority recruitment, and teaching excellence, among other goals (Berdahl & Holland, 1989; Burke & Serban, 1998). The current focus on faculty workload grew directly from the concern that institutions are not concentrating their efforts on student learning and seeks to highlight the importance of teaching (Presley & Engelbride, 1998). Higher education officials might argue that efforts to emphasize teaching intrude upon the autonomy of the institution, while legislative leaders may argue that such intrusions are confined to a proper topic. The authorities highlighted in this section further illustrate the need for a study about the methods utilized by department chairs in highly successful biological sciences departments to help their faculty garner external funding. The literature shows that research productivity is a valid expectation for faculty evaluation leading to promotion and tenure. In addition, it reveals that many faculty and administrators are factoring a faculty member's research productivity heavily when making decisions about promotion and tenure and in fact, when making hiring decisions.

Another challenge facing some department chairs is the review by external accrediting agencies. Some disciplines are required to meet minimum criteria in order to maintain accreditation. Higher education has been using accreditation as a tool for ensuring program quality since the late eighteenth hundreds (NEASC, 2005). The review process and expectations

may run from the mundane to the extraordinary but most include processes that are rigorous and require a concentrated effort on the part of the department chair. In addition to national accreditation agencies, regional bodies have also emerged. The development of the regional accrediting associations that function today was not only to guarantee that standards would be met but, equally, to avoid the possibility that these same standards would be codified and enforced by a government agency (McKay, 2004).

The landscape of higher education has continued to change. Since Vannevar Bush (1945) called the investment in science the endless frontier, there has been widespread recognition that investments in research and development would lead to economic benefits and improved quality of life for the nation. The change has caused uncertainty, adaptation, and evolution. Feeney, Mumpower, and Santiago (2004) claim that the acceleration of the process of globalization and the emergence of a knowledge economy worldwide have combined to remake higher education, especially public higher education in the United States. Human capital has generally been considered the main contribution of higher education institutions. Now, institutions of higher education are expected to go beyond this mandate as society seeks knowledge capital from them as well (Duderstadt, 2000).

Like the first academic revolution during the latter half of the 19th Century where universities shifted from a focus on cultural preservation to the creation of new knowledge, higher education has now broadened its mission to include the translation of research into bona fide products and new enterprises for the practical benefit of society (Etzkowitz, Webster, & Healey, 1998). A quick read of the websites of many universities in the U.S. reveal a decided slant towards economic development and public-private partnership opportunities. Such

partnerships are not a new feature in American life but appear to be changing in character, extent of collaboration, and number (Brown, 1985; Nelkin & Nelson, 1986). The idea of knowledge capital has been packaged as a potential driver of economic development in many states. When referring to higher education's role, economic development is understood to be a process of innovation that increases the capacity of individuals and organizations to produce goods and services and thereby create wealth (SRI, 1986). It is now accepted that elements of success include nearby research universities, a complex of firms in related business areas, strong regional organization to promote technology, and strong governmental support for research and technology development (Calzonetti, 2004). Newfield (2003) suggests that technology transfer has raised new questions about the world-making power of academic knowledge.

In recent years, universities have become increasingly popular as a place to funnel congressionally directed funds to jump-start economic activities in support of technology projects (Savage, 1999). In addition, state governmental leadership has attached economic development to the mission of higher education institutions, usually without the requisite appropriate funding. Powers (2003) notes that some public institutions with less state support may be seeking to leverage their involvement in technology transfer as a means of increasing their perceived level of excellence or relevance in the eyes of state legislators and taxpayers with the ultimate hoped for reward being increased state support. Cote and Cote (1993) suggest that state policy with the intention to stimulate economic development activity among higher education institutions must include a funding component. The increased external interest in university research places the expectation that university research will lead to local high-wage job creation, new business formation, and royalty and licensing income (Calzonetti, 2004). The

role of the university as an agent of economic change is gathering converts throughout the nation, and expectations are increasing that universities will become more mission-driven (Tornatzky, Waugaman, & Gray, 2002). Fueled in part by redefined external expectations for economic development as well as internal pressures to generate new sources of revenue (Slaughter & Leslie, 1997), this emergent commercialization mission for higher education is serving to transform higher education in substantive ways. Cote and Cote (1993) suggest that institutions are in a reactive rather than proactive mode, responding to external pressures. Calzonetti (2004) notes that this new model has been expressed as the Triple Helix thesis, which explains the new relationship among universities, industry, and government organizations. The proposition is that the goals of each are blurred and intertwined in the development of new systems of innovation. For instance, universities are now involved in economic development and industry is more heavily involved in university research (Leydesdorff & Etzkowitz, 2001).

But with this change comes a cry of caution from some corners. Bok (2003) warns that excessive commercialization may lead down a slippery slope that will change the character of the university in ways that limit its freedom, sap its effectiveness, and lower its standing in society. Daniels (2000) refers to this relationship as “corporatization” and insists that it indicates an increasing control that business corporations exercise over academic culture and governance. He notes that the major contemporary concerns at universities are efficiency and accountability, in their corporate sense, as well as outsourcing and downsizing—everywhere, the percentage of full-time, tenure-track jobs is decreasing, their places taken by temporary teachers, and researchers. Potential costs of campus/corporate relationships include threats to academic freedom, less open exchange of information, exacerbating the split between campus “haves” and

“have-nots,” conflict of commitment among the faculty, and subordination of fundamental institutional purposes (Bok, 1982; Brown, 1985; Fairweather, 1988; Langfitt & Ambrose, 1985).

What does this paradigm shift mean for the current vision of higher education? Nowotny et al. (2001) notes that the changing nature of the knowledge sector itself as the organizations involved in the generation and dissemination of knowledge become more diverse and acceptance of what constitutes knowledge broadens will continue to make it difficult to evaluate the effectiveness of academic knowledge workers. Newman, Couturier, and Scurry (2004) note that one danger in the shift toward competition and market forces is that it is almost certain, unless addressed by specific policies, to exacerbate another trend already evident: a growing gap between the public purposes that need to be served by colleges and universities and the reality of how higher education is functioning. Leveille (2005) notes that the public mission of higher education—which includes, for example, providing a high quality education to students regardless of socioeconomic status, researching new medical discoveries, and contributing to the economic, social, and cultural lives of the citizenry—is threatened as this competitive environment forces institutions to focus on revenues and prestige rather than their educational core.

Does this move predict a direction for university research in general or is it only directed at the industrial relationships being formed? Recent research suggests that as colleges and universities have strengthened their linkages with the for-profit sector, the result has been a shift toward more applied research and restrictions by industry R&D sponsors on the publication of new knowledge (Blumenthal, Campbell, Anderson, Causino, & Louis, 1997; Cohen, Florida, Randazzese, & Walsh, 1998). There is evidence that faculty involved in new ventures may be distracted from their primary duties as teachers and scholars as they seek to simultaneously

manage the enormous responsibilities associated with running a business (Campbell & Slaughter, 1999). The increasingly complex and controversial relationships among universities, researchers, and corporations led the federal government in 1995 to require researchers who receive grants from the National Science Foundation or the Public Health Service (the latter includes the National Institutes of Health) to disclose to their institutions any "significant financial interests . . . that would reasonably appear to be affected by [their] research" (AAUP, 2004). Cote and Cote (1993) note that decisions by colleges and universities to become involved in economic development activity are indeed complex, involving faculty expectations, reward systems, hope for increased institutional revenue, and a myriad of other issues, including the evolving role and mission of the institution. Universities are forging ahead with their technology transfer activities in a quest for new sources of revenue and new-found legitimacy as important sources of innovation in a competitive global marketplace (Mansfield & Lee, 1996). Institutions with closer ties to industry do generate greater numbers of spin-offs and entrepreneurial activities such as faculty involvement in new firms or institutional equity participation in start-up firms (Cohen et al., 1998; Roberts & Malone, 1996). Member institutions of the Association of University Technology Managers (AUTM) also reported that more than 2,500 new companies had been formed since 1980 for the purpose of commercializing a specific university developed technology (Powers, 2003). Mansfield and Lee (1996) found that institutions with more reputable faculties were more likely to be cited by industry as having contributed significantly to industrial innovation.

While some may wish that the addition of economic development responsibilities being added to the mission of higher education would vanish, it appears that not only is it here to stay

but may in fact be growing. It does not seem to have been institutionalized yet in the promotion and tenure process but it will be interesting to learn how department chairs view this issue, if they are devoting special attention to it, and how new faculty hires perceive this topic in relation to their careers.

In addition the issues of globalization and technology will bring new problems to colleges and universities struggling to provide quality with limited resources. The globalization of higher education has emerged as a recent phenomenon of study (see Green, Eckel, & Barblan, 2002; Altbach, 2003). Some universities, like Georgia Tech, Harvard and British Open University, operate in multiple countries. In an important but generally overlooked development, the World Trade Organization is now proposing to regulate higher education as a part of the General Agreement on Trade in Services, as it would any other form of trade—by removing barriers to its traffic (Newman, Couturier, Scurry, 2004). In addition, at least one for-profit, University of Phoenix, has begun operations in Brazil, Mexico, India, and the Netherlands and is eyeing several other countries (Business Week, 2005). E-learning offers all stakeholders the promise of access to a wider range of educational materials than ever before but it also raises questions when combined with the globalization movement. The curriculum wars, and the culture and control wars currently raging in the U.S. may be enacted in one form or another around the globe as policy makers view American models and debate their appropriateness in local settings, raising the question, “What is the best and wisest decision for a community?” (Marshall, 2005, pg. 1). Forms of open and distance learning offered around the world by institutions in English-speaking developed nations might, as Edwards and Usher (2000) claim, constitute an invasion that colonizes and denies local culture and knowledge and underestimates

learners. This can lead to what has been described as the ‘McDonaldisation’ of education (Smith, 2002). Smyth (1995) argues that the globalization of world capitalism has had a significant impact on higher education policy and produced changes in the sector, in particular, globalization has caused a major restructuring of the economy, and government has reacted within a corporatist and technocratic framework to create new technology-based industries. A major obstacle to faculty participation in internationalization is the effect this work might have on promotion and tenure (Olson, 2005). The challenges all of these issues create for department chairs and how they are addressing them will provide opportunities for research for many years.

The impact of external forces on higher education and the way department chairs lead is very interesting. It reveals numerous additional challenges for leaders in university departments. Discovering if and how effective department chairs are altering their hiring practices and mentoring programs because of these external forces will hopefully be revealed during the course of this project.

Chapter 3: Methodology

Introduction

How do department chairs of highly successful biological science departments facilitate positive research productivity out of pre-tenure faculty? The answer is important because the data gathered from this research helps to better explain what skills and training biological science department chairs should have or develop to be effective leaders. In addition, the results describe what new faculty hires in the life science disciplines require in order to succeed in their research endeavors. This study is also critical because of the trend by state governments to cut funding to institutions of higher education. External funding and the ability to attract it gains importance as an avenue to replace those diminishing state funds. The focus on biological science research links the issues of public health, quality of life, and healthy aging. The issues have always held importance but due to the mobilization of the planet's population, the spread of infectious diseases has taken on international implications. The success of department chairs in the life science disciplines takes on additional significance because their leadership ability may help to provide the most fruitful atmosphere for individual faculty members who are working on solutions for complex, devastating diseases.

In addition, the information gathered from department chairs at highly successful biological sciences units is useful to other institutions who aspire to climb the hierarchical ladder of prestige linked to research and scholarly productivity. While all of the suggested methods may not be transferable or applicable, with modifications respectful to each institution's culture and mission, the practices revealed will be useful for department chair training and development. The remarks from the pre-tenure faculty in these areas are instructional for this study but also for the

literature progression in the faculty satisfaction area as well. While there is existing literature on the role a department chair plays in faculty development and on the needs of new faculty, no study that I can find has focused solely on the high stakes area of biological science disciplines.

Research Design and Rationale

Creswell (2002) defined the characteristics of qualitative research as follows: 1) the researcher works in a natural setting. For those involved in education this means in schools, classrooms, alternative learning and clinical environments; 2) research studies can be designed and redesigned, as the investigator formulates and then revises the research questions, the data gathering techniques, and even the data being gathered; 3) data collection and data analysis can occur simultaneously. The theory is therefore not superimposed upon the data but emerges from the data that are collected; and, 4) the research is concerned with social process and with meaning, so that qualitative studies concentrate on how definitions are established by those whom the researcher is investigating. This study is well suited to a qualitative design because precise and logical numerical responses will not fully illustrate the complexity of this situation. It is the thoughts, perceptions, and assumptions of the department chairs and faculty that I sought to discover. Also important are the dimensions of attitudes or perceptions, the nature of people's experiences, and the elements operating within the system I chose to examine. The literature review revealed that there has been little research directed at this topic. As such, the study was exploratory in nature and sought to reveal trends, methods, disparities, and assumptions from the interviews. Some of the existing research on the broader aspects of this topic (department chair leadership, faculty productivity) has been accomplished by quantitative methods. A qualitative

study provides a deeper, richer interpretation of the qualities and skills that a department chair requires in the areas of leadership and faculty development.

Conceptual and Theoretical Frameworks

The conceptual framework for studying the topic of department chair leadership used in this study was Matusak's (1997) framework of core values designed to facilitate organizational prosperity in the new demanding social context and financial climate: (1) releasing human potential; (2) balancing individual and group needs; (3) defining and defending fundamental values through internal and external community; and (4) instilling and facilitating initiative and responsibility at all organizational levels. Matusak believes that leadership is an organic process that is relational and difficult to measure. She adds that leadership is about leaving a mark by initiating, guiding and working with a group of people to accomplish change. Although not specifically identified as such, many of her ideas point to the theme of mentoring. In this way, the framework she suggests is relevant and useful for this or any study on department chair leadership.

A constructivist grounded theory approach was used as the theoretical framework. Charmaz (2006) notes that the constructivist approach “places priority on the phenomena of study and sees both data and analysis as created from shared experiences and relationships with participants and other sources of data” (p 130). Constructivists have also proposed that human experience involves continuous active agency (Mahoney, 2004, p. 361) indicating that people live and grow in living webs of relationships. The how and why of the meanings and actions taken by the department chairs in specific situations are the focus of this study. Because the study focused on how department chairs lead, the constructivist approach creates a strong

theoretical framework from which to work. The relationships between the pre-tenure faculty and the department chairs, between the department chairs and the department itself, between the department and the institution at large, and all of the residual relationships that occur because of the other interactions will help to define the relevant data.

Demographic Data Sample

This project probed the topic of department chair leadership from two different perspectives: department chairs and pre-tenure faculty. As the study examined the actions of department chairs, it was vitally important to listen to the lived experience of leaders who are at the helm of highly successful biological science departments. It was also important to match the lived experiences of the department chairs with the perceptions of pre-tenure faculty in those same departments. In this way, we are exposed to several perceptions of the actual experience. The data reveal the methods that department chairs in highly successful departments have used and are using to create a climate that promotes success in research funding and scholarly production.

The intent of this study was to learn from department chairs that are leading highly successful biological science departments. Success in this study was determined quantifiably by the amount of external funding and scholarly publication output of the faculty from the six departments in the study. My study involved participants who were purposefully chosen from a group of highly successful biological science departments at higher education institutions in the United States. The department chairs were selected from a total list of 13 institutions that had been shaped with input from two highly respected professors in the biological sciences arena, as well as funding reports from the National Science Foundation and the National Institutes of

Health. In addition, several of the top journals in the field (i.e. PLoS Biology, Science, Biochemistry, Cell) were inventoried to determine the incidence of publication for universities using the ISI Web of Knowledge. I then spoke with two “experts” from the biological science fields. One is a former biology department chair and life sciences dean who is now in administration at the university-wide level at a highly successful East coast private institution. The other is a recently (2004) retired vice chancellor for research and professor of biochemistry that also served as editor of a top biological science journal for a number of years. The list of external funding and journal publications was further correlated to determine what departments at each institution should be targeted. Using the expert’s input in combination with the results of the journal counts, I was able to settle on six dynamic and productive departments. In addition, I asked them to identify two additional departments that could be used in the event I could not gain access to the first six. Although there was initial apprehension that this list would not yield the interview opportunities needed to complete this task, those fears were allayed. In only one instance was I not able to garner an interview with my top choice. In that case, the next most successful department was very similar in funding income and publication output and the department chair was willing to participate in my study.

The group dynamic of the department chairs represented a diverse sample. Five of the department chairs were male and one was female. Four of the department chairs were of European descent. One department chair was of Asian descent. One department chair was of Middle Eastern descent. All of the chairs held Ph.Ds, while two of them also held a medical doctorate. All of the chairs have been in their current position for at least six years with the longest tenure being 16 years. All of the chairs had been on the faculty at their current

institutions or former institutions. Four of the six had held a post-doctoral position before they accepted their first faculty position. Although I did not ask them for their age, it is somewhat apparent by looking at their vitae that no one is below the age of 40 and at least two are near or beyond the age of 60. The individual demographic data paints a clearer picture of the department chair participants. Dr. Braud was the only female of the department chair group. She is of European descent. Drs. Blouin, Gautreau and Jarreau are all male and of European descent. Dr. Fontenot is Asian and male. Dr. St. Cyr is a male of Middle Eastern origin. The departments range in size from over 60 to more than 120 members. All of the programs had a teaching component as well as a focus on research.

The second phase of the research project involved the use of focus group interviews. Smith defined group interviewing to be "...limited to those situations where the assembled group is small enough to permit genuine discussion among all its members" (Smith, 1954, p.59 cited in Stewart & Shamdasani, 1990, p.10). Glesne and Peshkin (1992) suggest that interviewing more than one person at a time sometimes proves very useful; some people need company to be emboldened to talk, and some topics are better discussed by a small group of people who know each other.

Denzin and Lincoln (1994, p.365) state that Merton et al. coined the term "focus group" in 1956 to apply to a situation in which the interviewer asks group members very specific questions about a topic after considerable research has already been completed. Kreuger defines a focus group as a "carefully planned discussion designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment" (1988, p.18). Merton et al. (1990) suggests that the focused interview with a group of people "...will yield a more diversified array

of responses and afford a more extended basis both for designing systematic research on the situation in hand..." (p.135). The faculty focus groups were selected after the initial department chair interviews were conducted. It was important for this study that I hear from the department chairs first before developing a list for the focus groups of pre-tenure faculty. The idea of using focus groups to gather information from the pre-tenure faculty was attractive to me because I have found focus groups to provide a good environment for sharing, competitive discussion, and provoking comments. In my experience as a participant and observer of focus groups, I have noticed that comments by one participant generally produce two types of responses from the other participants. The first is competitive in that the responder usually offers a comment that set them apart from the previous comments, usually in a more positive light. The second is provoking in that the responder usually challenges the initial speaker with another question or comment. Both of these exchanges can produce valuable dialogue that can be beneficial to any study.

I explicitly sought to include the pre-tenure faculty of the department chairs who described specific methods and cultures that existed in their respective departments. Several of the department chairs mentioned specific faculty by name. I was drawn to department chairs who related personal stories, using names and specific incidents. In this way, I was convinced that I would be able to determine the level of engagement that each department chair assumed they had with their faculty and compare it to the perception that the pre-tenure faculty held of that same scenario. This snowball selection process allowed me to select a few faculty to participate in the focus groups. I then used this information to create three focus groups of three faculty members each. I included at least one person in each group from the highlighted names that emerged during the department chair interviews. I then examined the list of remaining pre-tenure faculty

to complete the group. I revisited my criteria utilized to select the department chairs. I wanted to have at least one person who held an externally funded grant and one person who did not. I also looked at the aforementioned journals and only selected faculty who had an article published. In that way, I thought I would garner information from someone who may have benefitted from past mentoring and someone who was currently in the process of being mentored. I also began to look at gender and racial diversity in order to gather lived experiences from a variety of faculty. The following table displays the demographic data on the nine focus group participants as well as the assigned pseudonyms and current research productivity status.

Table 1: Focus Group Participants

| Pseudonym | Gender | Race | External Funding | Journal Publication | Post-Doctoral Position Held | Years of Service |
|-----------|--------|----------|------------------|---------------------|-----------------------------|------------------|
| Jewell | Female | European | Yes | Yes | Yes | 3 years |
| Troy | Male | Asian | Yes | Yes | Yes | 1 year |
| Wedney | Male | European | Yes | Yes | Yes | 4 years |
| Mary | Female | Hispanic | Yes | Yes | Yes | .5 years |
| Fellman | Male | African | No | Yes | Yes | 2 years |
| Anthony | Male | Hispanic | Yes | Yes | Yes | 5 years |
| Camille | Male | European | No | Yes | Yes | 5 years |
| Mattie | Female | Asian | No | Yes | Yes | 1 year |
| Alison | Female | African | Yes | Yes | Yes | 3.5 years |

Data Collection

Qualitative research requires that the researcher record the lived experience of the participants involved in the research project. This project was concerned with discovering the methods that department chairs of highly successful biological science departments employ to

facilitate junior faculty research productivity, the methods a department chair may employ to create a positive climate that leads to a productive department as measured by external funding and scholarship publications, and what pre-tenure faculty believe about the role of the department chair in facilitating their research programs. I determined that the most effective way to gather this information would be to conduct and record interviews. In this way, I would have narratives of personal experience for analysis. As Bruner (1997, p.15) notes personal narratives are “not merely information storage devices, narratives structure perceptual experience, organize memory, segment and purpose–build the events of a life.” By evaluating, coding, and capturing this information, I felt I could mesh the lived experiences into collections that would provide the answers to my questions.

The department chairs were interviewed individually. Four of the department chairs were interviewed in their offices on their respective campuses. One department chair was interviewed at a remote location while attending a professional conference. The final department chair was interviewed over the phone. This person was situated in their office on their home campus. The pre-tenure faculty participants were interviewed in groups of three. Two of the groups were interviewed on their home campuses in a conference room they provided. The other group was interviewed in a hotel room while attending a professional conference.

Before the interview process began, I filed the appropriate human subjects protocols and solicited approval of my project from the University’s Institutional Review Board. I conducted this study in an ethical manner exhibiting professionalism, empathy, and sensitivity in all of my interactions with the participants in this study.

I used a digital voice recorder for each interview. Before beginning each interview, the participants received a copy of the informed consent form (Appendix D) and was asked to sign it

indicating agreement. I also gave each participant a copy of the form that they could keep. During each of the interview sessions, I used a notepad to make notes about the interviews. Many of the notes I took related to the attitude of the speaker or the tenor of the conversation. In addition, I wrote down interesting phrasing or jargon that the participants used during the interviews. An important aspect of the role of the researcher involves how the interview is conducted. In addition to treating each participant ethically, I utilized several general interviewing techniques that I felt were important to the process. Table 2 summarizes the techniques which contained ethical dimensions as well as methodological strengths.

Table 2: Interview Techniques Utilized

| Technique | Detail/Rationale |
|---|---|
| Sitting diagonally across from the participants | Provides a less confrontational setting |
| Positive responses to comments | Participants were assured that there are no wrong answers; encouraging comments designed to elicit “deeper” conversation |
| Unconditional positive regard | Showing overt interest in participants as individuals by engaging in general conversation, minimizing defensive responses |
| Repeat probing | Rephrasing of questions, asking for examples or definitions gave clarification without suggesting participants were wrong |
| Active listening | Learning to listen and respond to participants’ comments rather than waiting to ask the next question |
| Active observation | Checking for signs that participants were anxious, distracted, bored, frustrated, etc. |

I firmly believe that the researcher’s interaction with the participants was enhanced by these techniques. In addition, the tone and setting both enhanced the process. Thus the researcher’s role contributed to ethical dimensions as well as data generation.

The interview protocols created for this study (Appendix A and B) were developed for a previous pilot study that I conducted in the early part of 2005. In that project I interviewed a department chair of a social science department in order to determine the methods of facilitation being used to promote research productivity. After completing that project, I used the experience and process to improve my interview protocol for the department chairs in this study. I also added a few questions that focused on the topic of pre-tenure faculty rather than all faculty. I then used the department chair protocol and my research questions to develop my pre-tenure faculty protocol. After I had conducted four of the department chair interviews, I revisited my pre-tenure faculty protocol and made a few minor changes to insure consistency between the two documents. After I conducted my first focus group interview, I added four questions and removed several questions. The original focus group had been asked the additional questions during the course of their interview. I have included a copy of the original pre-tenure protocol (Appendix C).

Each of the interviews were transcribed and returned to the participants for member checking. I allowed the participants to make changes and/or corrections. The alterations were very minimal. In fact, nothing was changed that would alter the mood or intent of the interview. The changes involved a few terms that were related to the jargon of the biological sciences and a clarification of a name that was given.

In addition to the interviews, I collected additional material related to the lives of the participants. I asked each of the department chairs and pre-tenure faculty members to provide me with a copy of their most current vitae. I downloaded a copy of each of the participant's webpages. In selecting the schools that were determined to be highly successful based on the

external funding and journal publication rate, I also collected information about each of the participants including some of the grants they had received in the past. I also was able, through the internet, to look at many of the articles that they have published in scholarly journals. During the course of the interview I asked each participant if her/his institution had a written policy for promotion and tenure. If they responded affirmatively, I asked if they had a copy. Again, if they answered affirmatively, I asked them to email it to me. In all of these cases, I received an email with the policy attached. In the cases where the participants said there was not a written policy, I returned to the website of their home institution and performed a search. If I located the document on-line, I noted this in my research journal.

Analyzing the Data

A grounded theory approach was taken at the onset of this study. I was also committed to a constant comparison model that would allow me to alter and improve my interview protocols by using the data gathered during each interview session. In this instance, I examined the data using a naturalistic approach where key concepts emerged from the data and the data are gathered in the field, in the naturalistic setting where they occur (Bogdan & Biklen, 1998). The process does at times follow a particular order but qualitative research does not lend itself to mechanical processes that are designed for specific outcomes. Instead, the systematic and disciplined process depends on the creative and conceptual ability of the researcher to determine meaning, relevance and connections. Analytical thinking requires the researcher to jump back and forth to rework ideas throughout the process. In addition, this analysis involves the interpretation of data by the researcher, and findings are “those of the analyst, and related to the overall direction and purpose of the research” (Dey, 1993, p. 98). The approach has grounded

traits and is certainly based on the evidence as presented but also represents the researcher's creative understanding and insight, conclusions, decisions and interpretations, orientation towards particular research questions, and the desire to respond to those questions in a particular way. All of this is to say that I offer an interpretation of this data, not the interpretation which refers to the constructivist theoretical framework used for this study. As Guba and Lincoln (1998) note, the "finding or outcomes of an inquiry are themselves a literal creation or construction of the inquiry process" (p. 143). I proceeded with an aim based on two analytical principles, that the analysis must acknowledge the connection between the claims and the evidence, and that the analysis would depend on the research questions and generated data. In this way, the analysis would ensure that the findings were valid, trustworthy, and useful with respect to the research questions they address.

As I deviated from a pure grounded theory project, I determined that I must establish an appropriate balance between the grounded and the researcher-directed analysis. I focused on the following three questions during the analysis process:

1. What are the data telling me?
2. What do I want to know?
3. How are 1 and 2 related?

Question one explains the analytical principle that requires a close relationship between hypothesis and empirical evidence which provides the link to the grounded aspects of this analysis. Although not perfectly matched to the Glaser and Strauss grounded theory, it exhibits grounded traits because the themes are allowed to emerge from the data. Question two alters the framework to include decision making based on which data were relevant to the research

questions and which were not. The first two questions interact and helped to guide the analysis process. Question three provided the mechanism to join the grounded and more researcher-driven aspects of the analysis. Figure 1 is used to illustrate the analytical framework used during the research project.

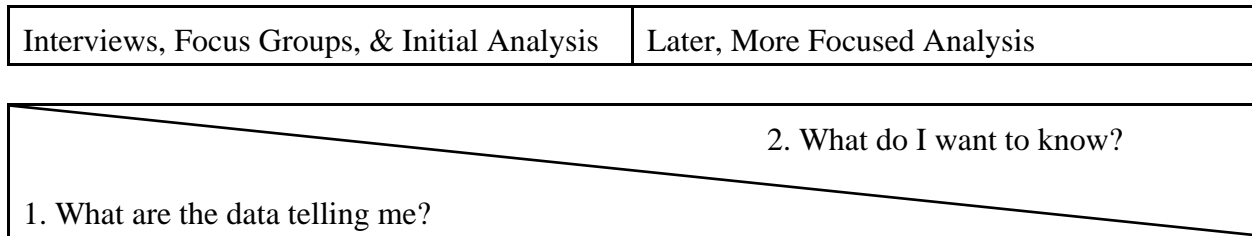


Figure 1: Analytical framework

The illustration demonstrates that both questions were important for the analysis throughout the process but in different ways. The questions were also emphasized at different times but provided a focus for the analysis. This process allowed the researcher to review the categories, coding schemes and compare and contrast the data. This interactive process involving both the researcher and data allowed for the main topics to remain in focus. Question three gained importance during the focus group interviews. It reminded me to stay focused on discovering methods that department chairs could adopt and not become consumed by the pre-tenure faculty's issues.

Initially, I sought to become familiar with the material in order to develop a broad overview in my mind. I knew that the data sorting would reveal key issues and emergent themes, but I needed to have a grasp of the entire set of data at the start. Immersion in the data involved listening and relistening to the tapes, reading the transcripts, and studying my observational notes taken during the interviews and focus groups. As I did this, I began to list recurrent themes and key ideas. The familiarization stage allowed me to make notes that I returned to later in

order to establish a thematic framework that I used to sort my data. This framework, informed by my initial research questions and goals, allowed me to identify emergent topics provided by the participants and themes discovered in the perceptions and experiences of the participants. As Ritchie and Spencer (1994) note, developing a thematic framework involves logical and intuitive thinking. I was forced to make judgements about meaning, relevance and significance. I also had to begin to make connections between the various ideas.

I depended on Strauss and Corbin's (1998) suggestion that grounded theory analysts work to uncover relationships among categories by "answering the questions of who, when, why, how, and with what consequences." (p. 127). But while Strauss and Corbin give us a good foundation, I found that the process of carrying out the analysis was ambiguous. I also worried that my original research questions would not provoke a response that would allow me to fully address my needs. I assumed that the coding process would provide some clarification and began the open coding phase of the research. This allowed me to examine each piece of data in minute detail and the initial categories began to emerge. I began to develop an index of categories that mimicked my research questions, while others were discovered from the participants. This allowed me to place my data into manageable groups that I could later retrieve and analyze. Moving into the second phase of coding where I systematically coded with respect to core concepts, helped to develop a more vivid picture of the scenarios that were shaping the leadership choices and decision making processes of all of the department chair. It was at this point, that I took many of the core concepts that emerged and began to flesh them out. I even returned to the participants with followup questions to learn more about certain concepts. I also noticed that my memoing became more complex as opposed to my earlier musings that were

general in nature. It quickly became apparent to me that this constant comparison method could lead to endless coding. In the end, I decided that any return to the data was only producing repetition and not providing new insights.

The coding of the pre-tenure faculty focus group data was made more difficult simply because there were multiple voices in each of the three interviews. In addition, as mentioned previously, many of the topics created what I have described as competitive discussion. This occurred mainly when I had faculty from competing institutions, which occurred in two of the three focus group sessions. As an example, when one of the pre-tenure faculty members would describe something in a very positive way about their home institution, a pre-tenure faculty member at another institution would give an example that was meant to depict their institution in an equal or better light. This also worked in reverse as well. There were a few incidents when one story that illustrated a negative experience was followed by another story that depicted an equal or worse experience. I would have to say that the focus group experience was very positive for me. It certainly produced a lot of rich data that could be mined for information. The group setting created a constant and engaging conversation.

Strategies to Insure Trustworthiness

The use of triangulation methods during this study reinforce the validity and credibility of the data. The use of recorded interviews, member checking of the transcribed interviews, and additional resource material (i.e. written tenure policies, faculty vitae) collected from the participants and the internet serve to insure that the researcher's methods are sound. In addition, I have solicited assistance from two colleagues who are experienced social scientists. They have reviewed my interview protocols, interview methods, and participant selection process and have

suggested enhancements to insure the validity of this study. The interview sessions provided thick descriptions of the situations and experiences. I have strived to accurately describe the environment and context of this study. The methodology used is sound and has been utilized successfully for a number of years. I have kept detailed notes of my analytical process described elsewhere in this study related to the choice of participants, the data gathering process, the research questions, and the methodology. In addition, I have attempted to be self-reflexive in all of the discussions of the data. I have maintained an audit trail and am confident that another researcher could conduct the same experiment using my methodology, technique, and analytical process and might arrive at many of the conclusions I have found. The differences will occur from the researcher being part of the qualitative process. Different researchers approach a project with different histories, biases, prejudices, and foci. My procedures have been well constructed and I conducted a pilot study which I described elsewhere. I have provided a clear and concise description of the data collection procedures that would ensure replicability of this study.

Conventional wisdom holds that research which relies on quantitative measures to define a situation is relatively value-free, and therefore objective. Qualitative research, which relies on interpretations and is admittedly value-bound, is considered by some to be subjective. In the world of conventional research, subjectivity may lead to results that are both unreliable and invalid. There are many researchers, however, who call into question the true objectivity of statistical measures and, indeed, the possibility of ever attaining pure objectivity at all (Lincoln and Guba, 1985; Eisner, 1991). The argument continues that quantitative researchers are selecting the topic to study and there is inherent bias in this process as well. Patton (1990) believes that the terms objectivity and subjectivity have become “ideological ammunition in the

paradigms debate” (p. 55). He prefers to “avoid using either word and to stay out of futile debates about subjectivity versus objectivity. Instead, he strives for empathic neutrality” (p. 58). While admitting that these two words appear to be contradictory, Patton points out that empathy “is a stance toward the people one encounters, while neutrality is a stance toward the findings”(p. 58). A researcher who is neutral tries to be non-judgmental, and strives to report what is found in a balanced way. That is certainly the approach I intend to pursue in this study. Lincoln and Guba (1985) focus on the "confirmability" of the research. In a sense, they refer to the degree to which the researcher can demonstrate the neutrality of the research interpretations, through a "confirmability audit." This means providing an audit trail consisting of 1) raw data; 2) analysis notes; 3) reconstruction and synthesis products; 4) process notes; 5) personal notes; and 6) preliminary developmental information. My study will follow the pattern that will provide the evidence required by this audit model.

Summary

Qualitative researchers have a unique responsibility to their participants and their readers. Since there are no statistical tests for significance in qualitative studies, the researcher bears the burden of discovering and interpreting the importance of what is observed, and of establishing a plausible connection between what is observed and the conclusions drawn in the research report. To do all of this skillfully requires a solid understanding of the research paradigm and, ideally, guided practice in the use of qualitative observation and analysis techniques. I fully intend to continue to develop my qualitative skills as a researcher. It is my hope that this project will illuminate the process and social mechanisms associated with department chair leadership and

pre-tenure faculty development in departments of biological sciences that exhibit traits of high productivity in terms of external funding and scholarly discovery.

Chapter 4: Findings from the Department Chairs Data

The following research questions were posed at the onset of this project: What are the methods that department chairs of highly successful biological science departments employ to create a positive departmental climate that leads to scholarly productivity? What are the methods that department chairs of highly successful biological science departments employ to facilitate junior faculty research productivity? What do pre-tenure faculty believe about the role of the department chair in facilitating their research programs? In this chapter, I provide answers to the two questions using the department chair data. The third question is answered using data from the pre-tenure faculty focus groups in Chapter 5. All of the names used to identify the department chairs and pre-tenure faculty are pseudonyms.

Departmental Culture and Climate

What are the methods that department chairs of highly successful biological science departments employ to create a positive departmental climate that leads to scholarly productivity? The first question is focused on the whole of the unit while the second question relates to the individual parts. This question brought numerous topics into focus during the department chair interviews that began with a discussion about building a department of excellence and creating a “fertile” environment. The chairs then discussed the process they used to select the focus areas of excellence and the resistance that can sometimes occur. The next step involved how the chairs established a recruiting plan that included hiring practices for their department. The broad topic of collegiality emerged as very important to the leaders, while several of the department chairs saw the development of a cultural mind set as being helpful to their mission of maintaining a department of excellence. In order to nurture the collegiality and

cultural mind set, several department chairs utilized social events and retreats. While, a few department chairs described various incentive programs at their institutions that they used to assist with faculty development. The idea of fully engaged leadership was an important idea that emerged from the data on developing departments of excellence. Finally, there is data to suggest that the evaluation of the new hires was partially responsible for the culture exhibited by these six departments.

Commitment to Building Scholarly Excellence

Department chairs of highly successful biological science departments described various types of activities that they used to enhance their department's research productivity both in terms of external funding and scholarly output. Interestingly, the data reveal that there was a "need" by the department chairs to "build something," the call to lead, and the enhancement of the department's cultural environment. This calling was an interesting response because it spoke to the motivation that drew the department chairs to their leadership positions. By describing their goals and dreams, the department chairs also revealed the methods they used to maintain the excellence of their departments. Blouin noted that his department's external funding had grown from "\$110 million to over \$190 million in four years." He said, "I had a lot to do with guiding the process, picking the division chiefs and the leaders who have been so effective at augmenting our programs. I have been involved in building this department with large grants from multiple investigators." Fontenot opined, "You just want to create an environment where very smart people can get together and as a sum, do more than what they can as individuals. If the environment is set up so that they can be successful, they will be successful. The question is whether you can create the environment to let them be successful." Gautreau noted that a "huge

amount of my efforts went into building the department,” and later, “you can’t build a department without considering the environment you’re bringing people into.” St. Cyr was most clear in his analysis and said:

I thought I would like to be department chair, to develop a department, do certain things to help other people’s careers more than help mine. It’s a process many of us go through. We observe how other chairs over the years did things and we second guess them and so on and develop an interest in what would you do to develop a department, build something of your own. I came here with a plan to do renovations, build the research infrastructure in terms of equipment in the department, and get the facilities ready for recruiting new faculty.

The idea of building a department evokes the notion of a foundation. Each department chair in this research study explained how it was important to have a plan of action that could be enacted which would in turn create the environment used to stimulate or maintain productivity. Effective leadership requires a desire to be successful and to help others be successful. It requires the courage to empower and develop others and to let them shine, to find joy in the success of others. Leadership requires a sense of purpose, ethics, and accountability with an ability to effectively communicate with a variety of people. It is also important to take risks and be bold, big thinkers but to have the courage to make mistakes and be held accountable. Leaders do what they say they will do, and they understand that they lose their credibility only once. Making a mistake does not mean that credibility has to be lost. Mistakes are allowed if the leader has taken the time and effort to build trust and has integrity and the best interests of her/his followers at

heart. The following sections describes methods the department chairs used to create the appropriate climate for success.

Avoiding Obstacles

As this research study developed, I determined that it would be most beneficial to investigate the most successful biological science department. In this way, I was confident that “best practices” would emerge. This also led me to assume that each of the departments in this study was operating smoothly with very few problems. The data show that this assumption was generally true in the present but some of the department chairs had encountered problems at the beginning of their leadership term. The data also indicate that some of the department chairs experienced obstacles or impediments as they attempted to change or alter the culture of their unit and before they could move forward, they had to resolve a few problems. By examining their experiences, others who assume leadership positions may avoid the same problems. Most of the problems they encountered involved senior faculty. St. Cyr offered the following explanation when discussing his attempt to change the status quo:

I did have some issues with some faculty when I first came and began to change things. A lot of people in education have problems with authority. You try to redirect the department and there were maybe too many changes for some people. So there were some challenges and I didn't want to drag my feet. Once I make a decision, if the decision is mine, I make it my responsibility to see it through. If it's a decision that I can give to the faculty, I give it to the faculty, and the committee or the group that reaches the decision is a decision I support and we go forward. You might have one or two faculty members who just don't like your decisions and can't accept it, but you have to move

forward and do what you have to do to develop the department. You can give people so much time to listen and then you have to move on. You can't debate things forever.

Fontenot echoed this story with one of his own, "for the most part, we only had maybe one really, truly disgruntled faculty member left, over the years, the other people who weren't particularly happy with the changes have left, pretty soon you end up with everyone on board. For me that was a real—I remember that happened about five years ago—it was a real transition."

Jarreau added:

people were worried when I came in because they liked me and knew I was coming from a good place but this place is great and so they didn't want me to ruin it for them. I talked about from the start that I am not here to change anything because we are successful but some things need to be tweaked. That little word set off fire alarms. I had little groups of three or four coming in asking if I was going to cut their group out or take their equipment. I told them I wanted to tweak the support for the department, the level of support from the dean, the attention that the university gave to our department. I learned to be specific when you can.

Later, Jarreau talked about a tough decision he had to make and said, "and in this case I didn't want to show my hand too early but I trusted one faculty with some information because I was trying to win him over and build a relationship and he burned me. My stuff was on a chat board that afternoon and I had to lay my cards down quick. That project was not a big success." The data here were presented from a historical perspective. None of the department chairs indicated that they were dealing with current broad dissension or faculty unrest. The comments describe a learning experience or "moment" for the department chairs involved. The perspective helps to

reveal that the leadership decisions made by those department chairs helped to create or maintain a positive climate that encourages productivity. The methods they utilized are revealed in the next section.

Determining Areas of Excellence

All of the leaders ran large departments with sixty or more faculty members. This can create problems and opportunities. What I found most interesting is that they chose to strengthen the department by selecting a few scientific areas of specialization. This method of selection allowed them to focus attention on areas where they felt the department could excel and become internationally or nationally known. It seems to have been a good strategy and beneficial to all of the highly successful departments in this study. Again, much of the perspective was historical in nature. St. Cyr indicated that his department was very “scattered” when he arrived but that now “we have created certain focus areas.” Jarreau relayed that his department was encouraged to select focus areas within the university’s annual review process. He stated:

Each unit within the institution should be able to justify the good things it has to offer and to make a cogent case as to why we should be supported. That process keeps us all from growing stagnant, it helps us keep in focus. We must check and recheck that the areas we are working in are appropriate. We are stronger as a department because we choose to focus on four or five key areas and build our faculty expertise in those fields. Fontenot’s comments are even more focused in relation to the specialties within the department, “we now have people, multiple people who are nationally known in their areas. We have people talking about them and our reputation is enhanced in those specific areas and that allows us to attract more people in that discipline.” Braud related her experience to the national ranking

process and said, “when you say a research area, you want people to say your department and you do this by having eight, ten people in that area who are stars or future stars. Your areas should all be in the top five in the nation.” Deciding on the focus areas also illustrated some interesting leadership traits towards building a program of national excellence. This led some of the department chairs to explain how the focus areas emerged and how faculty was added to these groups. St. Cyr opined:

I had a feeling for what was making headway in science and what the frontiers of biochemistry are and what they are finding in the areas and where the excitement is likely to be over the next five and ten years in science, certain areas of science. It allowed us to identify good candidates to add to the strengths we already had. My plan was to build strength with specializations. I really tried to focus on four, five areas. I could build strength with overlap between them, critical mass.

Fontenot said, “There is so much of science that is really about scientific taste, if you will, your ability to look at different areas of science to see whether you’re going uphill or downhill or if it is stagnated or if it has a future there. Some areas are so complicated, they have a great future, they are going to be around for a long time. Choosing that area to grow in was a no-brainer. So getting the department to pick areas of focus is good. We build around our good people and hire more green chemists, or whatever, get a bigger group going.” Braud, reflecting a more team oriented leadership style, noted:

I went to my faculty and asked them to rank the important areas in life sciences thinking forward to the next ten years. I then asked them if we were leading the nation in any of those. Two came through immediately and three fell by the wayside. Three more sort of

stayed around as the discussions went on and we felt like we could add maybe one or two and keep moving. The tough thing was that some people felt like we were moving away from them and I told them they could stay as long as they pulled their weight, we just wouldn't be adding any more people to their area. The ones that walked helped to create opportunity for adding to the other five areas.

The methods described above allowed the department chairs to accomplish their goals in a fairly innocuous way. They were able to fill vacancies through natural attrition. In addition, several of them allowed their faculty as a group to make the decisions on areas of specialization. In this way, there was immediate buy in on the part of the faculty to the department chair's plan. It is again important to note that problems in the life sciences are complex and require teams of experts to solve them. The strategy of building a critical mass of faculty experts in specific sub-disciplines will certainly create a positive, effective climate for research productivity. Once the departments had decided on the sub-disciplines in which they would invest their resources, the department chairs then had to insure the hiring process would be effective.

Recruiting for Departments

This research question was focused on the overall climate of the department. Could the department chairs guide the entire department in a way that maximized their efforts when it came to the hiring process? Faculty recruitment is certainly affected by the climate and culture of a department. When a candidate visits a campus, the process becomes double edged. The department is interviewing, inquiring and studying. The candidate is exploring, questioning, and responding. The process serves both parties but for different reasons. In the end, the department chair is responsible for the hire and the process. The department chair is also responsible for

setting the tone and establishing a climate for making the hire. This is not about expectations but about creating an environment for an effective process. Fontenot described, from a historical perspective, how the transition took place in his department from a place of negativity to a department that coalesced around the idea that the climate was evident to candidates visiting for an interview. He said, “It was a real transition, we finally hit the point where we could be fully democratic in hiring decisions, because everyone was on board for keeping it the best department as opposed to wanting to get their way.” Fontenot also talked about how the climate for new hires has changed over the years by saying, “getting away from that sort of past versus present mentality also was a big step for the department too—this feeling of this is what I did and that’s what they should do. Because times have changed and good people will walk and go to another good place, everybody wants them.” St. Cyr’s comments also bring clarity to the topic, “faculty recruiting is a process we go through, sometimes more frequently than other times. But it’s a very important factor really in developing a department. You need turnover, you need to keep your productive people and make them more productive and allow them to function at their best. That is the atmosphere you want to project.” Braud noted that “a level of trust has been maintained over the years among the faculty when it comes to new hires because one faculty cannot be on every search; they trust that their colleagues have the department’s best interest. Also, they can do their part by doing other things like keeping the halls cleared, volunteering to go to lunch with the candidates or encouraging everyone in their lab to attend the candidate’s talk.” He also noted that the interview process can be used as an:

advertisement for the department, even the ones we didn’t hire, after they leave they say, I don’t know if I am going to get the offer or not, but I would come if I was offered—this

is a happening place. There can be no better advertisement for a department. When you interview four or five and they go back and spread the gospel, so to speak, that boy, it didn't work out there but, man, that's a great place. I want to go back and work with professor X, no matter if I get the job or not—you cannot get any better advertising. That mind set is about putting your best foot forward during the interview process. You challenge the department to do the very best you possibly can. I think we do a damn good job of that.

Many of the department chairs discussed their strategies for making a hire and described how they focused on the specific traits they search for in a potential new hire. As a general rule in higher education, the chair selects and appoints a search committee of faculty who then make a recommendation to the chair. The chair must approve the hire and may have to present and defend the selection to higher administrators in the university's hierarchy. In addition, the chair must convince the candidate to accept the offer. This process allows the department chair to have tremendous influence on the hiring process. This process is not unique to this study but the data reveal that the department chair in this research study viewed each search and hire in a highly structured, strategic way. In addition, while it is the initial step in this cycle, I felt it was important to focus on mentoring initially. Fontenot said, "if you know how you want to grow [the department] you have to put the ad out that says specifically what you want and eliminate those other applicants, because you're wasting their [the applicants] time." Later in the interview he added:

Last year we had two top candidates who were both very good. One worked on feet and the other worked on the eye. Now, the National Eye Institute has historically had the

highest funding level so we went for the eye person. If you can get into an institute that has a high payoff, you are going to do better. You have to take the whole NIH grant thing and just put it under a microscope and just make these rational, reasonable decisions. You just have to look at where the most likely chance of getting into a fundable source.

Gautreau concurred, “we would rather see someone coming with a grant, because the dollars allow you to do the work, the national level sort of funding is what you certainly want to see.”

The comments indicate that chairs are placing heavy emphasis on funding potential which implies that chasing the money trail at the federal agencies is a significant part of the hiring equation. St. Cyr notes that “it takes certain people who know the complexity of biology to make medicine advance. We hire people who can communicate the subject matter very well, have good interpersonal skills and bring a personal aspect of all this in their science.” Gautreau repeated the requirement for funding and added, “we look for excellent letters and training with some of the best people in that field but also you’re looking for a fit–personality wise, level of motivation, energy, enthusiasm, that team spirit.” Blouin echoed the earlier sentiments about funding and added that he looks for “creative ideas, willingness to work hard, intellectual capacity, collegiality, and integrity.” While many of the traits in the coveted skill set were different, all of the department chairs specifically emphasized the funding requirement.

Blouin, Braud, and to a lesser extent Jarreau discussed an interesting component to hiring practices, something that has created controversy on many college campuses. Blouin stated, “my department is extensively inbred, particularly at the junior level. We pretty much train our own and that’s a lot less expensive than recruiting from the outside.” Braud shared a similar view and noted, “we are producing the best graduates in our concentration areas and we tend to keep them

here, the comfort level and the team building and development are set, so the environment is fertile for productivity.” Jarreau added, “there has been a softening on the point of inbred hires, some of our more opinionated faculty have begun to suggest it [may be acceptable], at least in the hallways.” This paradigm shift could indicate that the departments are valuing personality, fit, and collegiality rather than the perceived stigma attached to hiring your own graduates. It could also be tied to the notion that hiring from within can be less expensive in terms of start up and relocation expenses. In addition, hiring from within helps to maintain a sense of loyalty on the part of the faculty who may be less likely to leave a quality institution that has provided a solid opportunity.

The search process is geared toward the expectations of the highly successful department. In response to a question designed as role playing, where I played the part of the recently hired faculty and wanted to know what I needed to do to get started, three of the department leaders were adamant that I would not have been hired had I not known what to do to get funded or published. The other three department chairs expressed similar confidence in their hires but clearly thought that sharing their methodical approach would be beneficial to the new hire. Fontenot said,

One of the things we do in our interview process is require a regular seminar and a grant seminar, we want to know what their first grant is going to look like; if you are going to spend time putting ideas on paper then it’s NSF, then it’s NIH, something that is going to help your future, your national reputation.

“Anyone we hire would already have a reasonable sense of what they need to do and the top two or three programs in NIH that suit them, or the NSF panel they are going to encounter,” noted

Gautreau. “We hire folks who know their way around the Federal funding agency hallways and labs,” said Jarreau. These comments echoed the earlier sentiments expressed during the question about hiring strategies. The other three approached the question from a different angle. Typical of this group was St. Cyr’s response:

Start tracking the grants, but the most critical part for the individual is their research plan. I advise them to prepare the draft of their proposal in the same lab they are in before they come here, because they are with the people who are the experts in that area and they can get some feedback on their proposal. There are certain patterns that over the years you find typical of new people writing their grants, they tend to propose too much. They tend to over explain things in science. Also, get started early so you can show your draft to other people and discuss your ideas and so on.

Braud and Blouin offered similar detailed advice. In the end, the comments expressed by the department chairs in this study related to the hiring process served to illustrate that the mentoring process is enhanced by the hiring process. Candidates for hire are already learning the expectations of the department during the interview process. In addition, the data reveal that the successful candidates may not be the typical hire elsewhere. Because of the current success of these six departments, the applicant pool may be more advanced than the pool at an aspirational or regional university. Regardless, the department chairs are taking full advantage of the opportunity and definitely utilized the process to enhance future success of the department.

As further proof that the interview process enhanced the productivity expectations, the hiring practice focused on each candidate’s previous career path with an emphasis on funding and journal publications. The six highly successful departments studied here all followed a

similar pattern when it came to the career path of their hires. They all required post-doctoral experience of each applicant. St. Cyr's response is typical, "To be competitive for an offer from my institution, a candidate would typically have to have five or six years of post doctoral training and have published good papers in good journals. We look at the technical aspects of the work and even the intellectual foundations. Have they worked on interesting problems?" Blouin added, "When you put an ad out you're going to get some really terrific people but where they are post-docing, their training, their publication records, that is what you are looking for." Braud said, "when I call my friends at other top institutions to talk they know what I am really after and they will start the conversation telling me about the hot post-docs that match our areas of specialization. It's a joke with us now." The responses here begin to provide a clear picture of the hierarchy that exists in the life science disciplines. It also helps to explain why many of the faculty are successful in garnering external funding. They are provided a fairly long incubation period where the skill set they will need to succeed is modeled by more experienced researchers. The post doc process seems to be the next step in the educational process for those in the biological sciences. It is an internship for faculty in training. The data is clear when it comes to faculty searches in these six departments; the chairs are guiding the process and influencing the outcomes by their decisions and selections related to the search committees. In addition, the search process has been refined by the department chairs and each decision has strategic implications.

The department chairs in this study have succeeded in creating and maintaining a positive climate in this instance by communicating the message clearly. The respective faculty appear to agree with the message and the positive climate enhances the search process. Once the team of

researchers is in place, what methods do the department chairs employ to create a collegial atmosphere?

Encouraging Collegiality

Research in the life sciences is by its very nature collaborative and requires teamwork as well as the ability to engage with others around a common problem because the issues are complex and demand a team approach to problem solving. With this in mind, collegiality becomes important for this research study. Collegiality is a means utilized by the department chairs in this study to improve the culture of their department. Each of the six department chairs discussed the need for collegiality in order to maintain productivity. The department chairs explained how they used the collegial atmosphere to enhance the scholarly output in their units. Blouin said that collegiality was a “long-term tradition,” at his institution. He noted:

collegiality here exceeds anything that I’ve seen in other high powered institutions. What I see here is a tremendously effective and unique spirit, people who aren’t collegial are almost ostracized by the rest of the faculty, they either reform or they leave. The institution does not support people who are non-collegial, the core values of the institution, officially, are excellence, integrity and collegiality. I think that expresses a lot about what the institution is about.

Fontenot used other terms to describe the collegial spirit of his unit, “we can learn from each other so, it’s all about trying to orchestrate how to make the department one unit that functions synergistically where people can turn to each other for help and for advice and you don’t have to go outside the department necessarily.” Later he noted, “We are sort of more like a family than anything else, we get together in the conference room, eat pizza and drink beer.”

Gautreau opined, “even in the interview you are looking to enhance your collegiality, I want [the candidate] to be able to interact with others and if you can’t, we need to know that early on. The department wide vote on candidates always includes a discussion on collegiality. That’s why the faculty put so much work in the choice initially.” Later, when talking about maintaining collegiality, he added:

I think people do pull for other people in the department because they do realize that success of one person helps us all. The more successes we have of individual faculty, the better the whole department is. It is important to do. There’s good collegiality that way in terms of faculty being genuinely happy for other people that do well. Are there exceptions? Yes, but I am talking about the majority here

St. Cyr said, “Are they generally happy when other people get grants? Yeah, I mean, I would say so but, you know, there are jealousies—like he’s doing better than me but that turns into peer pressure.” Asked how he is able to nurture collegiality, St. Cyr responded, “we usually have lunch and I treat everyone to lunch, that brings the department together and allows us to compare notes. I don’t take minutes because I feel the faculty should feel free to talk about anything they want, very informal, and lots of people come. Collegiality is a fragile thing that cannot be imposed on people; it must develop from feelings of trust.” Braud talked about collegiality first when she was describing her former position and comparing her institution now. She related that “collegiality is very highly valued and always comes up during tenure talk and hiring decisions. It is so highly valued that we have not offered one or two big stars a job because they came in to the interview with the wrong approach or their current institution indicated that they were loners or not big team players, more interested in pushing themselves to the detriment of the school.”

Jarreau added, “we want a close cohesive department, or as close as we can be with this big of a group. There is peer pressure to get along and be supportive, it is nice and I think I help it along by making sure I recognize a lot of people for the things they do or the awards or grants or mentions in newspaper articles. The younger faculty brought this idea in years ago and it caught on and spread.”

Fontenot referred to the climate of a department as “a mind set.” He used a rather unique story to illustrate his point:

I had one guy on the faculty that I hadn’t seen for about five years and I talked to him one day and he started talking to me. He started interacting in the department in a much more positive way. I think he just got over a hurdle, a mental hurdle, but his research was dead and then he retired but he’s the biggest supporter of the department. When you see him, he’s proud to have retired from our department. But it was such a shift, but it was because the department is so successful now, he’s happy about that. It took a while but the mind set changed his attitude. He turned out to be a good department citizen over the last years.

Gautreau noted “a level of trust, with time, developed” that helped to create a mind set of “pride in the department.” St. Cyr offered that a “successful faculty” helps to “drive the department into the future and that’s what’s going to make the department viable and creates the right attitude. Good habits come from that.” Fontenot’s comments are a fitting conclusion to this topic as he added, “if you have a weak department, you can’t expect to hire a star or recruit a star into the department. Our attitude helps us to keep our stars and more want to come.” The department chairs revealed several methods when describing how collegiality is enhanced or maintained. It

is important to note that the collegiality was described in terms of how it affected the research productivity of the department.

Because collegiality is so highly valued, I felt it was important to determine the strategies used by the department chairs to maintain the cultural mind set that was present in the successful units. The data reveal that social events and retreats are just two of the methods that department chairs can use to build a healthy climate. The department leaders discussed the importance of both of these methods to the development of a culture that promotes productivity. Blouin said, “We tend to have a lot of social events. We have a lot of holiday parties and get together at the department level. We spend more money than most places in fact on parties and social occasions. We do a lot of it and I think that helps collegiality a great deal.” Fontenot added, “We have Christmas parties, some function in the fall, some function in the spring and then other things are more spontaneous.” St. Cyr talked about how a researcher can become disconnected easily because they are isolated in labs:

as you get more involved in your own responsibilities and so your world becomes a little more localized to your [lab] group. We have a number of social functions where we happen to get together and talk. We usually build these around some special event like lectures, we might have a reception, go to dinner with a visitor. We have a number of those activities that do bring us together socially. We have a Christmas party, a staff appreciation party, a few small functions in the spring like a departmental picnic. We have sub-groups that meet because of scientific specialty—talk science and drink beer. I think it is important to have the social things just so you feel you’re in a normal world.

The department chairs also utilized retreats to develop and maintain the climate. Blouin stated, “the dean hosts a two-day retreat once a year over a weekend at a nice resort about one hundred miles from the campus.” Braud reported:

There was a tradition to have retreats with other departments but some key people came to me after I arrived and asked that we separate ourselves. So I formed a committee to plan an intensive retreat. I even went to a big supporter of our programs and asked for money to have an off-campus, really nice, special retreat. Almost all of our faculty showed up that could come and we had the post-docs there also. Now I just watched the first day and that night a new faculty came and asked if I was going to take over tomorrow. I just said we’ll see. But the next day went great and I just was very happy and we left that place as a close, cohesive team with some good plans and good spirit. I had never been involved in a retreat like that. I liked that I was able to participate as well. It was very uplifting and has carried us forward

Fontenot opined, “We have an annual department retreat. We’ve done it for two years. We’re going to be doing our third one this year, where we go away for a long weekend. It’s not mandatory but close to 100 people show up. Not all faculty members come because of their commitments. Last year a couple of faculty members were excused because they said that’s not my idea of fun. But everyone had so much fun and my bet is that those two will come this year.” Gautreau noted, “I initiated the faculty retreat because I felt like we had to do something like that for the reasons that we are talking about [culture and climate], to give greater opportunities to talk to each other outside of the faculty meeting. I have tried several models for this and I’m not saying one is better than the other. I would like to have 90-95 percent of the faculty there at these

retreats and it was probably 75 percent but the right people were there, the key people were certainly there.” The department chairs were adamant that the retreats they held were beneficial to maintaining a healthy, collegial climate. They did not dwell on the impact on the pre-tenure faculty specifically but instead implied that the social events and retreats allowed the social network of their department to more fully develop. In addition, social events of this sort tend to serve as acculturation conduits as well. The department’s norms, values, and practices are shared among the participants both in word and action.

Rewarding Excellence

I had assumed that the six institutions would have various types of incentive programs for garnering research funding. These types of faculty development support opportunities are becoming somewhat of an industry standard in higher education. When I asked them about the types of programs they had, I got very different responses. Blouin included it in the broader context of encouragement, “those efforts [research funding] are rewarded and we appreciate their contribution.” Fontenot noted that successful faculty may receive “bonuses” or “salary enhancements.” Later he explained, “I am big fan of incentives, if you can create incentives you are going to get people working harder and working more, incentive programs are terrific. We use incentives to spur research in certain areas.” St. Cyr was one of two leaders to mention an “internal program for funding at the departmental level,” and added, “the President sometimes announces a funded pilot project, that is usually funded by a lump sum award from a large donor.” He noted that he always encourages the faculty to apply. Braud talked about using “pots of money” [indirect return] to “fund issues that we know are important, things the NIH is looking at, so we can get an edge and good data.” Institutions that do not invest in faculty development

programs are in danger of falling further behind in the research funding competition. By providing small grants that allow faculty to gather data or develop experimental methods, the university is providing a valuable enhancement that can make the difference for a grant proposal. In addition, the institution is viewed more positively by the faculty member and a valuable relationship begins to develop. This strategy can be a key component for creating a positive climate for research productivity in a department.

Fully Engaged Leadership

What can a department chair do personally that could have a positive impact on the climate of their unit? One important strategy emerged during the discussions with the department chairs. The effort required to manage a large biological science department is labor intensive. All of the six department chairs in this research study were once active researchers who also had teaching duties. Accepting the administrative position meant that the department chair had a decision to make about their research program. Operating a large, vibrant laboratory and serving as a department chair of a large biological science unit is a daunting task that can quickly become overwhelming in terms of time and effort. The paradox that confronted these department chairs who had to decide whether to maintain an active research career during their leadership term emerged at various times during each interview. I had observed anecdotally that administrative leaders at all levels who continued to operate a research lab usually struggle to find the time to maintain a constant level of effort in both jobs. The success of the lab usually depended more on the leadership of a stellar lab manager while the department chair was pulled by the multitude of administrative responsibilities. The data is clear on this important topic. St. Cyr said, "I have to keep my department at the top. You can't get there by working half a day.

You will have to be awfully efficient to be able to do it.” Gautreau added, “At the beginning, I still had my basic research component in my job. But there is only so much you can do. A department chair is expected to do so much, a lot of things. I finally had to go cold on the research. I decided to get totally serious about keeping us on top. It takes more than eight hours a day, five days a week.” Jarreau noted, “Some folks say that not having a research program disconnects me from the other faculty. That obscures the fact that in most cases, we administrators share the exact same values and goals as faculty members. Most administrators hold faculty rank. The us versus them rhetoric obscures the complexity of academic leadership. I have to serve as the principal advocate for our department’s faculty, staff, and programs.” Blouin opined, “I have a pretty absolute concrete idea about what my job is and is not. I push issues that are important to my department. I’ve never totally given up my interest in certain aspects of research but I gave up all my research grants [a number] of years ago. It’s one of the major failures in my view of chairs, the idea that they just continue to spend large amounts of time doing their own research while running a department.” Fontenot arrived at the topic in the context of his rise to the position and said:

Actually my taking over the chairmanship at the time was not popular at all. I felt the department had to develop some new areas of research specialties, I decided early on that we needed self-focus for the long haul. It’s almost impossible to make big changes in a short time in a democratic way. I made my share of mistakes. But a lot of chairs really don’t take this very seriously. It is a service. I didn’t simply want to baby-sit. So I made the tough decision to lay aside the research program for now. It’s very time consuming.

But you can't run a department that way. And the stressful thing is that it affects other lives and sometimes that makes me mad.

Fontenot was referring to the fact that some of the researchers in his lab lost their jobs. He did tell me that he was able to place most of them in other labs within the department or university.

Braud said:

The person I turned to when I was offered this job told me I would have to give up my research lab and be an administrator. I said I thought I could do both because I don't need much sleep and I really like to work. It quickly became a conflict for me because it turned into what we really wanted to be as a department meant I needed to give it a lot of time and effort. We are in the top group after some really hard work and lots of resources, good hires, and we don't want to drop. So I transitioned my lab over to other people and got out of the game at that level. But I stepped it up on other fronts like on national service efforts so that I could talk about my department and faculty. I was sad but the results of this [faculty] group in my department has turned that into good feelings for me and I am very satisfied with my decision. Now my impact is bigger than just one lab.

The data were clear that serving as a department chair of a large biological science department was a full time job. In order to build, enhance, or maintain a program of excellence, these leaders could not perform in a dual capacity and they relinquished control of their labs and consequently their research programs. It is noteworthy to add that several of the department chairs continued to write grants but these proposals focused on departmental needs like graduate student stipends or equipment and facilities. These serve as concrete examples of the sacrifice that can be involved when assuming positions of leadership. In addition, the department chairs

were able to use their grant writing skills for the benefit of the entire department in some instances.

Ethical Evaluation

The issue of ethics emerged in the discussion with the department chairs as a recurring theme. This question relates to how the department chairs can effect change. It is about facilitation methods from an individual perspective. The chair is crucial to the faculty hire because they are perceived as the person with power and authority by the candidate and the new hire. In addition, all new hires do not succeed even in this highly structured, resource rich environment. What can we learn from the department chairs in this research study about ethical leadership as it relates to mentoring? Is acting in an ethical manner an effective mentoring technique as well?

Gautreau noted how expectations change over the course of a faculty's career and offered the following, "People bring different things to the table depending on their years of experience. And so, you have to keep that in mind when you're dealing with people." Later, when discussing the notion of being honest with a pre-tenure faculty about their progress and potential, Gautreau said, "are you really doing this person a favor by extending the process another three years when maybe the person could do something different with their career and be more successful at it, a better match for their skills?" St. Cyr echoed these sentiments saying, "by the three year review if we decide that there is really little likelihood that the person will get tenure, I advise them to find another job essentially at that time instead of wasting their time." Jarreau spoke in specific terms on this topic, "it is really important for me, the university and the assistant professor that we have an ethical process for tenure and that we are open and honest with how the person is

moving along and making progress. I always am honest but also make sure that I am not overly harsh or abrasive when I tell them bad news.” Braud added, “Being honest is important to me. I think a department chair without ethics is a liability to a university.” In these four instances, the ethical treatment explained by the department chairs becomes another mentoring method. It may not be able to be directly linked to research productivity but more generally to good leadership on the part of the department chair. People expect to be treated ethically. The honesty exhibited by the department chairs in this study provides a good leadership development model. In addition, the chairs that focused on how they delivered their message provide a model for ethical leadership. Operating within a certain code of conduct illustrates the importance that these chairs placed on ethics. The atmosphere created by that type of leadership can certainly enhance productivity in general. In addition, utilizing mentoring methods that are imbued with ethics is the correct approach.

Summary

The idea of building a department and creating a “fertile” environment defined the motivational factor for the six department chairs in this research study. It was a paradigm shift away from individual gratification or success for the department chairs to a more significant impact that served the greater good. I had the sense that they were focused on celebrating the success of others and that was feeding their own satisfaction needs. The topic of collegiality emerged as very important to the leaders. It is a topic that is often talked about but rarely quantified. I felt that in some ways these chairs did quantify it and collegiality certainly emerged as one of the benchmarks used to measure a faculty candidate. Several of the department chairs felt that the idea of a cultural mind set was very important to the success of their respective

departments. In fact, the shift from a negative mind set to one that was inclusive, open and communicative became part of the quest for a few of the department chairs in this study at the very beginning of their leadership tenure. The topic of social events and retreats emerged from several conversations as well. These were other methods used to build a sense of community. A few department chairs described various faculty development methods used as incentives at their institutions. This was crucial as it sets the tone that indicates to the pre-tenure faculty that the department chair is supporting their efforts. The mentoring process was revealed to begin during the hiring process. It was here that the department chairs began to mold the search process in strategic ways in order to enjoy maximum benefits from the new hires. Finally, the idea of fully engaged leadership was closely examined and the data reveal that ethical leadership enhances the process by creating a positive environment that builds trust and commitment on the part of all departmental faculty.

Facilitating Faculty Productivity

What are the methods that department chairs of highly successful biological sciences departments employ to facilitate junior faculty research productivity? While the first research question was about the department as a whole, this question focused on the individual faculty members. Data were collected to determine how life science department chairs aided pre-tenure faculty in their quest for external funding and journal publication. My research uncovered three broad methods and three interventions that leaders of these highly successful departments employ. A method in this instance is an organized mechanism that may be a written or unwritten. It is a recognizable systematic way of doing something by the department chairs in this research study. The interventions utilized by the department chairs in this study are options that did not

emanate from a written or unwritten policy. The methods included (1) mentoring, (2) explaining the expectations early and often, and (3) encouraging interdisciplinary work while transitioning the faculty member to independence. The interventions by the leaders included (1) providing protective measures for the pre-tenure faculty members, (2) reducing or removing teaching responsibilities from the new hires and (3) providing an orientation to the departmental faculty who are evaluating the pre-tenure faculty about the sub-disciplinary differences related to funding and scholarship. Throughout the interviews, the leaders also discussed the topic of ethics in relation to human resources and career development.

Mentoring

I asked each of the department chairs in this study about the term mentoring, the use of mentoring committees, and their impression of how effective mentoring can be for new hires. I also spoke with them about how mentoring committees are created in their departments. Although the focus was on measuring how the department chairs felt about mentoring as a method for faculty development, I was also interested in learning how the chairs led. I was specifically hoping to discover if the new hires were involved in the selection of their mentoring committees. I felt that this issue was important in determining the level of control the department chairs held over this activity as that could be indicative of their leadership style. In addition, I knew that this would be important when I discussed the topic of mentoring with the pre-tenure faculty. How each of the two groups felt about the effectiveness of mentoring was important in answering this question.

There was commonality among the department chairs when asked to define the term mentoring. Several noted that the term was “often overused” or “a loaded term.” Blouin

explained that mentoring is “almost an angelic relationship between a more senior person and a more junior person.” Fontenot felt that “mentoring and nurturing are similar terms.” He said that the chair should “be like a parent to the junior faculty, answer questions, provide them with good advice, follow through, and find out later what is going on.” Fontenot clarified later that “the mentoring part is the providing the advice, but the nurturing part is the follow through,” adding, “[mentoring] is very time consuming, the section leaders function as mentors while the function of the rest of the department is to do the nurturing.” Braud also suggested a familial relationship, suggesting that “mentors need to take their mentees under their wing, like a hen does with her chick.” Gautreau replied that mentoring involved “providing guidance with a background of experience” but added that frequently peer to peer mentoring is “less formal.” Gautreau explained later that “people bring different things to the table depending on their years of experience and so you have to keep that in mind when you’re dealing with people.” St. Cyr defined mentoring as “advising a more junior person on how to proceed with things” and felt the best mentors “work by example, by coaxing, by interaction—that’s usually mentoring in that it has a softer tone to it, rather than ordering people to do it and making sure they do.” The important lesson revealed by the data on the topic of mentoring illustrates that this topic is complex and multi-layered. Although a few of the chairs felt that the term mentoring was overused, none of the leaders were willing to dismiss the method as useless.

All of the six department chairs explained the concept of mentoring through the traditional method described in the literature. This method suggests that a mentoring committee is assigned to the mentee. The most common number of committee members was three. All of the department leaders but two had preselected the mentoring committee before consulting with

the incoming faculty hire. Two of the department chairs (Braud and Blouin) consulted with the new hires before appointing the committee. Two of the more important issues that emerged from the discussion about mentoring committees were the effectiveness of mentors and the evaluation of mentors by the mentees. Blouin opined:

there's some doubt in my own mind as to whether the most effective mentors are the people who are loved and have great affection from their mentees, or whether, in fact, the most effective mentors are the people who are tough and demanding and insistent on quality and perfection and challenging the intellectual ideas of the young person.

Braud noted that her best mentors were those that were “brutally honest with the mentee while being aware of their fragile state.” St. Cyr felt the harshest criticism should come from the department chair, “it seems to work better, they feel more comfortable, they don't mind looking at me as a boss because the dean appointed me the boss.” He later noted that in the best case, mentoring happens “informally, junior faculty seek out senior faculty.” The plurality of opinions about the mentoring committee selection process was altered by two department chairs. Gautreau felt it was best to “appoint those committees in consultation with the new hire; designing a committee that you felt would bring balance to that assistant professor and give him some good direction.” Braud added:

The mentoring committee should always be a group decision involving all parties involved, the new hire is asked to suggest two names, the current faculty are asked to self-nominate themselves and then I look at the best matches and try to insure that we are not overloading some more than others. These groups need to have something in

common. The specialization area is a good start but I try to find out if they clicked with someone during the interview.

Jarreau disagreed, “These kids coming in don’t really know what is best for them. It is my job to mentor them and I make the tough decisions based on what I think they need—tough love, coddling, hands-off.” Blouin shared that “one of the very important aspects of the annual review of assistant professors is their self identifying the presence and the adequacy of the mentoring they received.” This was a unique opinion but certainly one worth exploring. I wondered if the pre-tenure faculty who were successful, receiving praise, raises, external funding and publications, were more likely to report favorably on their mentoring committee. It seemed to be axiomatic but I definitely wanted to see if it would emerge in my focus group discussions. Fortunately, some of the pre-tenure faculty who participated in one of the focus groups were from Blouin’s and Jarreau’s department. Again, it is important to note that all of these department chairs found mentoring to be an effective method to enhance junior faculty members research productivity. How the mentoring teams were selected presented the only difference of opinions. It became clear that the traditional model of mentoring, where the committee is selected from among the senior faculty, was the one these chairs were most familiar and comfortable with.

On the topic of the effectiveness of the mentoring, department chairs feel it is important and effective in light of the existence of a mentoring program at all six institutions. A more traditional response to the question about the importance of maintaining mentoring committees came from Gautreau who said:

that's why the faculty put so much work in the choice initially because once the person comes, then you want to do everything you can to make that person successful. You don't take the approach of, okay, the person's in, now sink or swim, go for it guy. That's not the way we approach it. Even if a person maybe had voted no for the candidate, then the process, that's over with. Then everybody is on board.

But a closer examination of the data reveal different motives for the cultivation of the mentoring programs. Fontenot notes that the mentoring program helps "keep morale going" and "creates role models in the department; young people can come in and say that is what I want to be, that's what I want to do." He adds, "it's all trying to orchestrate how to make the department one unit that functions synergistically where people can turn to each other for help and for advice and you don't have to go outside the department necessarily."

Mentoring was also credited by the department chairs for helping pre-tenure faculty avoid certain pitfalls. Fontenot opines "I got caught myself personally doing things that probably if I had been mentored, I wouldn't have done. I would have spent my time more wisely, so I try to tell people that." Fontenot also felt that mentoring committees can perform "a lot of things for someone new to the game in terms of how to maneuver that grant to a certain study section at the NIH." St. Cyr noted that the mentoring committees "challenged the faculty on where their efforts went over the year and if they are spending too much time working on committees and struggling to get their paper published." He concluded that the faculty are asked "to make a general plan for the next year with set expectations." In addition, some of the schools had mentoring committees that targeted certain activities. Blouin noted that in addition to the pre-tenure faculty mentoring, the school had "several [mentoring groups]" including "one targeted at

medical students, particularly from under-represented minority groups and a task force devoted to women's issues in general, as well as both formal and informal mentoring groups." Gautreau also reported having multiple mentoring groups for "grad students, post-docs, and beginning, early career professors. The department chairs were actually quite active in utilizing mentoring methods. The data show that most department chairs looked at mentoring as a way for senior faculty to share their experience with the junior faculty.

Early Expectations

The majority of department chairs interviewed for this study utilized a method I describe as "explaining the expectations early and often." This method illustrates that the apprenticeship process is very much alive in the life sciences and appears to be effective. The in-vivo term I used here emerged during an interview and I discovered it in my memoing. As Gautreau told me:

I talk one on one with the new hires. I'll sit down with the hire multiple times, along with their mentoring committee, and we talk about strategies for funding so that all the professors have an absolutely clear and clean view of the expectations of the funding, that's the goal. By the time you come up [for tenure] we want you to have established an independent research program, be publishing data that originated and was gathered at [our institution] with your own graduate students in good, quality journals. And we want to see evidence of national funding, a very nice NSF or NIH grant.

And St. Cyr expressed:

I meet with new faculty more often, formal meetings, to evaluate what's happened, they fill out a progress report with their major accomplishments, whether they got any new

grants funded with the ongoing project, where their effort is going and we discuss what the expectations are for the following year. The letter of employment is quite detailed in terms of expectations and to some degree we say you need to bring in this many dollars, usually a quarter of your salary from outside sources. We have an incentive plan that returns funds to the faculty beyond the 25% indirect rate.

Jarreau said, “The offer letter lays it out very specifically and backs up what they have been told during the interview, I make sure the folks in the department tell them what we expect. The orientation and the operating manual draw a clear picture about our high expectations. I feel confident that they know what to do,” added Jarreau. Braud was the most emphatic along this line and added “if they don’t know what we want after the interview, letter, orientation, mentoring meetings and my meeting, they are simply not listening. They hear it early and often and you begin to hear them share it with their students and post-docs.” It is clear that department chairs leading the successful units examined for this study are confident that the pre-tenure faculty are receiving a clear, consistent message about the expectations of the various institutions. Their comments on this topic illustrate that the expectations of the department and chair are clear and repetitive.

The method of reiterating expectations emerged again and again. Gautreau notes, “I also have meetings with the non-tenured assistant professors as a group and give them a copy of the university guidelines.” St. Cyr described a set of “productivity guidelines that is used in the annual review” and notes that if they are not being productive with their grant submissions “you express a lot of concern, you make a list of concerns and we discuss them and remind them of the expectations.” Blouin described the existence of two official documents that he depicted as

“very detailed” and “legal documents that govern faculty affairs.” He noted they “are written in formal terms describing the responsibilities of the faculty, the opportunities they are guaranteed, and the criteria for promotion and advancement.” One manual Blouin described as “much longer and more detailed and softer, describes the pathways for success and the needs for success. That is provided to every new faculty member with tremendous encouragement for them to read and understand.” These comments illustrate that the expectations are given in writing as well as verbally and come from a variety of sources.

Integral to mentoring and setting expectations are benchmarks. This study was designed to understand how department chairs can nurture productivity. In this case, productivity is partially measured by research funding; however, no minimum amount is articulated when it comes to external funding expectations. The chairs all said that they do not have a set chart with minimum funding amounts. But frequently the message about funding expectations was confusing and contradictory. Gautreau opined “in terms of a minimum sort of qualifications that it takes to successfully go through promotion, we don’t spell that out.” However, later he stated, “what we do expect though, we make that very clear.” He did not give me any other specifics. Fontenot added, “we don’t absolutely tell them you need so many dollars in grants, that’s all done very loosely. You can’t really put it on paper, you can’t write ‘you need a RO1 [NIH research project] in order to get tenure,’ but you can tell them and that is what we do.” Braud said, “What is written in the employment manual and what we expect doesn’t match, that is written for all faculty, some departments bring in nothing, contribute nothing to the external pot but that’s not what we are about. You better have a couple of grants and one better be NIH or you are done.” Jarreau notes, “the written and the verbal are conflicting, you need to be funded

and you need good funding from the NSF or NIH, but the tenure policy is so loose, warm and fuzzy. I don't think that is fair. Tell them what you want and deal with it." The data from this topic was one of the few instances that did not support the results. The departments are highly successful in garnering external funding and publishing scholarly results. The expectations of the department chairs were very clearly explained to me. The methods employed were not as clear. It appears that the pre-tenure faculty are hearing about the expectations but the written material and policies may be contradictory or less concise

Balancing Interdisciplinarity and Independence

The third method employed by the department chairs involved the use of interdisciplinary teams of scientists to work on research problems. The pre-tenure faculty were integrated into these interdisciplinary teams. But there was an interacting factor at work here. The department chairs also talked about pushing the pre-tenure faculty to develop independent research programs and labs. As I have discussed in previous parts of this dissertation, the national trend at the federal funding agencies is for larger, interdisciplinary teams to solve the very complex problems that exist in the life science arena. The data here would seem to indicate that new hires are caught between the need to work with others on problems while establishing themselves as competent, independent leaders in a sub discipline. The data from the participants helps to clarify this situation. Gautreau said:

You have to establish your independence, it's important. Then how do you do that in the context of interdisciplinary work? That's a fine line for the assistant professor to walk.

We encourage interdisciplinary activities but we don't want you to come up for promotion and tenure with your only grant that you have being a big, multi-investigator grant because that is not going to truly establish your own research program.

Braud agreed by saying, "Look, we love interdisciplinary work but don't forget that you want to get like more or less a single PI grant that's going to establish your lab. You've got to cut the ties with your post-doctoral advisor. You can't keep publishing with your post-doctoral advisor, at least for now, because that is going to affect your tenure case." Blouin said, "Faculty members need to find a place in an already existing program in which they can develop and be mentored but that means they have a hard time exerting independence. The lab chief is very inclined to put their names on papers of the young person and limit the young person's independence in the research program." The extreme case was revealed by Jarreau who noted:

The major PI will try to hold on to their old post-docs even when they are at another university. That's got to be stopped and I have to step in and make the cut. But we also have a strategy that promotes interdisciplinary work while helping our new hires build an independent lab. Our senior professors will let the young hires have a paper or two at the start and they get theirs later as the work proceeds. Once the new hire is settled, they can go back to collaborating with their old mentors.

The data on this method for facilitating research productivity provided an opportunity for comparison when I interviewed the pre tenure faculty. It was interesting to see how the new hires handled the stress of cutting ties with their former mentors without damaging a valuable relationship that could benefit them later. In addition, it illustrates a point of stress for all new faculty who must begin to build an independent research program but are pressured to interact

within collaborative teams. The following section describes some of the approaches used by the department chairs to aid in this endeavor.

Protective Interventions

Three important topics also emerged from the data related to the intervention methods that department chairs employed on behalf of their new hires. These issues involved effective methods that department chairs used to protect their pre-tenure faculty from distractions and ensuring that each pre-tenure faculty was judged fairly in relation to scholarly output. Of particular importance to many of the department chairs interviewed was the issue of serving as a filter or “firewall” for their pre-tenure faculty in various situations. Frequently department chairs are called upon to prevent relationships or preempt responsibilities that they feel may be harmful to their new hires. These interventions were closely linked to time management and priority setting by the pre-tenure faculty. Fontenot said:

I put most of my emphasis in making sure that they don't have issues that might distract them, especially women. As soon as you hire a woman scientist, someone is going to be on them to sit on this committee and that committee and be a woman in science person. I tell my faculty member, wait until you are tenured because this can eat up a lot of time, so just be quiet and say no thank you.

Braud opined, “I basically serve as a firewall to keep the spammers away. The spammers in this case are people who like to create lots of special committees and put lots of folks on them. I let the new hires know that I will take on the spammers so just blame me and tell them to talk to me if they have a problem.”

The second type of intervention involved release time from teaching to allow the pre-tenure faculty to focus on their research program. St. Cyr said, “When they generate a lot of grant funds, maybe 50 percent of their salary, I have to give them more time to research and less time for teaching. I lean on those who are generating less research funding to teach more and protect the new hires from heavy teaching loads.” Blouin also lightened the load noting, “for the research-oriented faculty, the first couple of years are very light on teaching.” All six of the department chairs reported assigning lighter teaching loads to the new hires or offering to let them double their teaching load in one semester so that the following semester can be reserved for their research.

The third type of intervention involved how the pre-tenure faculty were evaluated and directed inward. This intervention becomes important in departments that range in size from the lower sixties to the 120-130 members. The department chairs spoke about the “education” process used on the mentoring committee or department at large in relation to faculty evaluation. The department chairs each explained that different research areas have different evaluation benchmarks because funding is not available or distributed equally. All six of the leaders expressed an awareness that different areas of the biological sciences require varying levels of funding. In addition, they shared their awareness of the various costs associated with performing cutting-edge research in the sub-disciplines. They then were careful to explain that “it was important that they shared this information” with all of the faculty in the department “who would be evaluating the new hires.” This intervention was intimately involved in the promotion and tenure process employed in these six departments. Gautreau’s comments illustrate the point very clearly:

The chair of a broad department has to have some appreciation, legitimate appreciation of the traditions, customs, and expectations within the sub disciplines of biology; otherwise you are going to have a real problem making evaluations of personnel. It's really, really important. It doesn't take near the dollars if you are a field ecologist or a theoretical evolutionary biologist, it doesn't take near the dollars to support your research program as it does to be a molecular neurobiologist or molecular genetics. You can't do anything in molecular biology without a fair amount of money. So we can't evaluate one factor to the next, to the next, based on dollars. That is absurd in a field as broad as biology where the expectations of funding differ depending on sub disciplines and its availability differs depending on the area. You've got to look at it within the discipline that that person resides. Is that person competing in the field of ecology? Is she doing the things that are expected of an ecologist, versus a cell biologist, versus a biochemist, you have to think of it discipline specific, that is absolutely critical.

Jarreau agreed, "An ecologist can come up with the notion and get a grant for \$200,000 over three years or something like that. That would be small peanuts for a molecular biologist who would normally go for a NIH grant that might be four or five times that size." Blouin also agreed and added that "we have to be clear with all of our senior faculty that these differences are real and need to be appreciated during the tenure process." Gautreau said, "The numbers of papers that an ecologist might publish might be quite different from the number of papers a molecular biologist might publish, because the minimum publishable unit of data might be different." Jarreau added, "Each of our groups have national leaders, stars, and they are able to judge the

quality of a new faculty's work. The numbers don't always tell the story and you must look at what is acceptable in that specialty area.”

It was obvious from the data that the department chairs wanted to limit the amount of time the pre-tenure faculty spent away from the unit. However, there appeared to be no apprehension on the part of the department chairs that those types of relationships (i.e. service on committees) may also be beneficial from a social networking aspect. The intentions of the department chairs were meant to be positive in all of the interventions described above. The lighter teaching load would appear to be an effective intervention that allows the pre-tenure faculty more time for research. The department chairs did not relay any negative reactions on the part of the faculty who assumed a heavier teaching load. I think it is important to note that the department chairs understood the need for training and communication about faculty evaluation procedures. Rather than relying on assumptions, the department chairs exhibited good leadership by reminding the senior faculty of the differences among the sub-disciplines in the biological sciences as it relates to appropriate funding and publication rates.

Summary

The data reported here provide valuable information for department chairs, faculty and administrators associated with biological science departments. The participants were very forthcoming about the methods that they feel are effective for building and maintaining a highly successful department. The method of mentoring that was utilized by these highly successful departments has been explored in detail. While some of the data revealed that the chairs felt the term of mentoring may be overused, none of the department heads dismissed the effectiveness of their mentoring program in place. Mentoring was described as providing a valuable avenue to

aid the new hires in avoiding pitfalls and understanding the expectations of the institution. In addition, the use of mentoring as a method allowed the department chairs to have the expectation message repeated to the new hires from various sources. Mentoring was also effective in providing a template for new hires to begin to establish themselves as independent scholars while integrating them into existing interdisciplinary research teams. Intervention methods were revealed by the data as well. Department chairs assumed a protective role for their new hires both from an over-commitment standpoint and in how the pre-tenure faculty were to be evaluated for promotion and tenure. In addition, the department chairs structured the new faculty hires' job responsibilities to allow for the maximum amount of research time and opportunity versus the teaching expectations.

Chapter 5: Other Perspectives

The Role of the Department Chair in Facilitating Research Productivity

What do pre-tenure faculty believe about the role of the department chair in facilitating their research programs? The interview protocol (see Appendix C) used for this portion of the research project is similar to the department chair interview protocol, but focuses on pre-tenure faculty members' perspectives on what department chairs in highly successful life science departments do to promote productivity. I was intent on keeping the research project focused on discovering the mentoring methods used by department chairs because I believe that would be most helpful to current and potential department chairs who want to focus on increasing the research productivity of their units. The data from the department chairs represent eleven themes. The next step in this research study involved going to the pre-tenure faculty to see if they would agree with the department chairs assessments. I will begin by describing the three focus groups with some detail, being careful not to reveal their identities. I will then present the data that focus on the pre-tenure faculty's individual needs. That will be followed by data that focus on the needs of the department as expressed by the pre-tenure faculty. Chapter five will be devoted to comparing and contrasting the data of the department chairs and pre-tenure faculty. In order to provide a useful comparison, I have included data on several topics of concern to both the department chairs and the pre-tenure faculty. The first is the issue of promotion and tenure. The department chair data reveal a strong notion that the expectations are clear. What do the pre-tenure faculty say? In designing this research study, it was assumed that the department chair is a factor that helps to determine the success of a department. I have therefore included a section on this topic from the pre-tenure faculty perspective. One of the methods that department chairs in

this research rely on to promote research productivity is release time from teaching duties. Do the pre-tenure faculty hold the same opinion on the effectiveness of this method? Finally, I have included a section on the data that reveal the pre-tenure faculty indicated that the “little things” were important to their success.

The Personalities of the Focus Groups

Focus groups provided a useful setting for gathering the data. The interesting thing that I learned from this portion of the research study is that each focus group had a personality that emerged during the discussion. Group A was a very agreeable group. Most of the responses in this session were similar and that stayed consistent throughout the interview. Although they were at different institutions, the participants made several comments (that cannot be revealed here because it may identify the participants) that explained to me why they were generally in agreement on certain topics. Group B had some disagreement throughout the interview but frequently agreed. It seemed to me that they were each trying to provide different answers to the questions in an attempt to be helpful to me. I stated during the interview that it was okay to agree if it was honestly what they felt. This group was also the most diverse in terms of institutions. All three members were from different universities. Group C emerged as the most congenial group. They all were at the same institution and it was obvious that they enjoyed working with each other. It was also obvious that they socialized both within the functions of the department and outside of the constraints of their jobs because some of their responses included personal information about their colleagues.

Individual Needs of Pre-Tenure Faculty

As in the previous chapter, I divide the data into topics about individual needs versus the needs of the collective departments. I focus here on what the pre-tenure faculty believed about the efforts of their department chairs.

What is the most important thing that a strong department chair can do for an individual faculty member? Jewell said, “Run interference! I will not succeed unless I have someone to run interference.” Fellman added that he needed “to feel supported from the very beginning and the smart department leader will make sure that each person is equipped to succeed, to grow, and to produce.” Troy said, “most of the people consider the major duty of the department chair to be to distribute the department[al] resources to everyone.” Mary agreed “the most important thing is to provide the support that you need, adequate space, adequate equipment, supplies, and adequate manpower.” One of the more personal responses came later in the discussion from Jewell who said:

“running interference is critical but also providing very valuable feedback for me on how I’m doing relative to other members of the department. I expect him to challenge me and expect more of me than maybe I expect of myself. And then to be able to communicate that, but also I expect him to treat me fairly.”

Camille said, “It takes someone who has courage to be a department chair because it feels to me like a lot of people want to blame them for problems. Our dean is notorious for not supporting our program even though we are the biggest grant producers. But my chair, she fights for us and really works to protect us.” Anthony opined, “my chair has courage too and really cares about

people. I like him and he likes me. He is happy to see me get another grant or a pub or if my post-doc gets a paper published, he is happy about that.” Jewell noted:

our department chair has special skills in terms of communicating effectively. He also provides moral support. I have a lot of experience with other chairs of other departments and it is not the case at all in many other departments. I think my department chair is unique in that he seems to have the interest of the junior faculty in his best interest. Other department chairs seem to be more egocentric.

Most of the data here centers on the need for relationships. The pre-tenure faculty received personal attention of course but it was also obvious that they had a relationship with their chair that may have enhanced their perception of the type of treatment they were receiving.

Communication is Key

The idea of an environment that allows and promotes dialogue and communication emerged from the focus group data when the topic of culture and climate was discussed. Although the idea of a culture usually refers to a unit, in this case a department, the data reveals an individual slant on the topic. Wedney said, “it is important to my success that I have an academic climate where you can talk about things. Even if someone’s not directly in your field, just kind of bump ideas off and things like that. This department is diverse but I find it refreshing, because there are people who I can bounce specific ideas on, that are really detailed and related to my work.” Anthony felt that his department was “very collegial” and “I rarely have trouble finding help. We have a lot of opportunity to gather and talk about ideas and problems. I am comfortable with my colleagues and they are really smart. The chair is a connector, he puts people together in a good way.” Camille noted that he noticed the “family

climate right off the bat” and felt that “there was a free flowing communication atmosphere here that actually encourages us to share ideas. It comes from the chair, she is very open and friendly—sets the tone.” Anthony noted that his department “has a retreat” and that “it was good but it had a political style or flavor to it. There was not enough personal interaction.” Mattie said, “Our annual retreat is a big deal, now remember I am going into my second year but apparently some faculty did not attend last year. But there was so much talk about it around here that everyone began to ask when it was. I really enjoyed it because I had a year under my belt and could really participate and listen. It also allowed me to network and I knew where to spend my break time, who to talk to.” Alison said, “Yeah, I heard about your retreat. We asked our chair to talk to yours and get the notes so we can copy.” Mary said, “I have only been here half a year but I have heard about the annual retreat and I am anxious to participate.” Wedney went against the majority of opinion here but noted that he “is a loner, I like to be left alone. Aside from the yearly review, I don’t know that I need a lot of assistance. I made an excuse and begged off and the chair was fine with it. I may have to go this year. I went the first year. People seemed to like it but that is not for me.” The various methods used by the department chairs to build collegiality seem to be effective when looking at the data from the pre-tenure faculty. The opportunity to network and receive immediate feedback appeared to be useful and important as well.

The Mentor-Mentee Relationship Explored

The opinions of the department chairs on the topic of mentoring were revealed earlier. The addition of the data from the pre-tenure faculty allows an alternative view. The pre-tenure faculty were generally favorable about the topic of mentoring although they had a few concerns. This data explores mentoring from a personal level. Wedney felt that mentoring was “for the

most part more in the lines of guidance. Just someone who would point you in the right direction, steer you, give you advice on things to do.” Mary felt mentoring meant “active guidance—not in the role of a parent necessarily but a person that provides guidance in a specific area, has experience in that area.” Troy felt mentoring was “a sort of help to transition from one stage to the other stages” He also noted, “this role can be confusing so if you have somebody [who] can give you [their] opinion, it is very helpful.” Jewell opined, “I think that word in this particular context means, in a general sense, providing resources that will promote the interests or encourage the interest of the scientist in my case, not only the physical resources, but also the psychological support. A mentor is one that challenges the junior faculty to stretch a little bit beyond what the junior faculty thinks he or she is able to do.” Mattie said, “Being in a large department with multiple buildings makes it harder for new professors to form close relationships with people who will decide whether to extend their contracts or approve their tenure bids. Who is going to mentor me to get through the gauntlet when I have to trek all over campus and try to find them?” Alison said, “My mentoring committee had been selected before I got here. I told my chair that I was not comfortable with really depending on these people to show me the way to tenure, read my grant proposals, partner with me. I asked for some changes related to diversity and he complied.” Anthony felt that mentoring was “like an apprenticeship” and that “they held my hand the first two years but then pushed me out of the nest.” He added laughing, “I stored it all up for the person I will mentor. They had better look out.” Camille said, “Mentoring should not be like a family relationship. It should be professional and uplifting. I am not a student anymore.” In addition, a few of them felt that they did not mesh well with their pre-selected committee. Mary noted, “I am flying blind a good deal of the time.” Jewell said:

so my mentoring committee had been informally designated before my appointment but was formally identified when I accepted my appointment. That really didn't work for me so I am using my department chair to mentor me and he has provided unabated psychological support. Also, the people I work with directly have provided more of the physical resources and have challenged me.

Anthony said, "My committee could never really get together so I met with the three of them at separate times. You guessed it, I got three versions of things and most of the time they were conflicting. When I pointed that out, they said the other person was wrong." It was interesting to note that the data revealed the department chairs were familiar and comfortable with the traditional mentoring model while a few of the pre-tenure faculty talked about abandoning the traditional mentoring model and adopting the more contemporary versions that feature peer-to-peer mentoring or mentoring groups. None of the data revealed that the department chairs knew that the other types of mentoring existed or that their faculty were using different models. Troy opined, "I talk with my colleagues here more than I talk to my mentoring committee. In fact, I haven't seen them formally for over six months." Mary added, "Yeah we have really good talks and read proposals for each other. I consider this [the focus group] my real mentoring group." Fellman noted, "I work in a different area so I don't really join in all the time but I know they are there for me. I have formed a mentoring group with two other junior faculty in my area." Finally, some made suggestions on how this process could be improved. Mary said, "I think the library should set up mentoring lounges where we could gather with coffee and talk." Alison said, "Someone who is really smart should come up with a training seminar for faculty mentors. They could coach them on what to do and maybe include things like cultural sensitivity training."

Summary

The mentoring committees did not all receive glowing remarks from the pre-tenure faculty. The data revealed that the pre-tenure faculty were very adaptive when it came to finding a mentoring model that could provide the appropriate support for their development. The flexibility and critical thinking exhibited by the pre-tenure faculty in this research study may indicate that this pool may not be representative of the larger population but their approach is certainly one that can be emulated elsewhere.

The Departmental Perspective

Again, returning to the model used for the department chair data, this section focuses on the expectations the pre-tenure faculty held in relation to what effective department chairs should do to improve the department as a unit. The initial responses were general and varied, focusing more on the hypothetical department rather than their own departments. Wedney stated, “I think the most important things for a department chair to do as far as building a department would be to hire the right people and to do whatever he can to provide the best infrastructure.” Mattie added, “As an academic, you're trying to get ahead, but as an administrator you're trying to make things happen for other people. You're not advancing your own program but advancing the department, and you're more service oriented. In the end, it is all about the people and a smart chair will fight to get the best people and support them.” Alison agreed that “yeah, the people are very important but the good chair has to be able to pick them or get other people to believe that they are the right fit, but you really want to focus on building a good team of smart, dedicated people.” Shaking his head in disagreement with comments from another focus group participant, Camille said, “I think the chair needs to bring folks together and make sure that we get strong

teams formed. That is how you protect the younger folks and run interference if that is indeed needed.” Anthony added, “If I was department head, I would try to make sure that my unit had resources and I would make sure they were distributed fairly but also reward the best faculty.”

Wedney thought a department chair should “obtain either university funds or general funding [for shared equipment needs] even if he doesn’t say, write an equipment grant himself, at least coordinate others to do it. That’s the kind of thing that needs to be done to be competitive.”

Alison opined, “our department chair has single-handedly taken this unit to a new level, even in the face of poor leadership at the provost level. Our provost just doesn’t get it but do any of them? But by focusing on how to keep moving forward, improving, building this tight knit family atmosphere and leading, he has made a difference for us.” Mattie agreed with the previous statement and added, “it has not been easy because there have been budget cuts from the state and different deans but our chair has stuck to the plan that we all helped to develop and he is a true leader. We have sustained our excellence because he is willing to think long range ideas and push for us.” This prompted Alison to add, “he will not back down when it comes to holding everyone to the benchmarks we set and he gets called on those as well. He knows we are going to measure his progress like he measures ours.”

Wedney said, “the chairman has to protect what we have here now and I think he’s done a pretty good job of that to this point. What is going to be important [for the future] is that the chair keeps what he’s got and keeps the good people here from leaving. His honesty helps and he admits when he makes mistakes—refreshing hunh?” This prompted Anthony to add, “oh my chair is very much like that, that is not unique to me but I see what you are saying. That ego stuff can be a killer. I don’t think successful chairs can have that self-centered ego. They need to like people and be liked.”

Fellman added that

“many of the administrators they bring in here are trying to move up so they really don’t care about the institution. They get run off pretty fast. We are protective about our place. We want to be seen as the leaders. We work hard to solve tough problems, it is what drives us, so if you don’t want to help, stay out of the way.” Wedney added later:

Our institution has this grand plan with a fancy name. A lot of the faculty when I came in made jokes about it and called it the Grand Delusion (pseudonym). Our department chair led us through a retreat that focused on how we could align what we were doing in our department with this document. He then used that to go and ask for new money to help. It worked and the change in attitude towards the plan was immediate. Our chair got the bigger picture.

Fellman, opined, “People in positions of authority must be especially careful to use nonthreatening methods when trying to build collegiality. I think that my chair uses his position in the right way.” Mary said, “Leadership is about having a very clear vision of what you want to do and being able to communicate that to others.” Mattie agreed that open dialogue was important adding, “if you don’t have other experts who are willing to help you, you are doomed. The thing is, they have to want to do it to be helpful because there frequently isn’t a big reward for them. The chair has to get people to want to help.” Alison agreed with the comments of Wedney but noted, “my former institution was not as friendly. The chair there was rarely around and liked to hide behind his closed office door. People felt like you would steal their ideas. That school is not very successful. Here it is the opposite. I trust that my colleagues will help to build my idea into something better.” Mary felt that it was important that department chairs understand that “they have an obligation not just to avoid secrecy but to actively promote a climate of

openness. In fact, fostering a climate of openness and transparency is the first step to avoiding the kinds of jealousies that do exist.” Camille, responding to the previous comment added, “I know all about that political stuff but our chair really throws that out the door before we start. Her approach to our retreat is to make everyone very comfortable and set the tone that we are all colleagues trying to make the department better. She must have taken a facilitation seminar because she really keeps people on track and away from bullying. Our retreats are good.” It was refreshing to hear that the pre-tenure faculty actually were involved and concerned with the department at large. The data reveal that not only are they aware, they appreciate good leadership. The comments denote that collegiality and loyalty are active components of the various departments examined in this research study.

Promotion, Tenure and Expectations

One of the most significant milestones that a new faculty encounters is the issue of promotion and tenure. Faculty must work to build a portfolio that includes external funding, journal publications, as well as teaching and service expectations. As this study focused on the methods utilized by department chairs to facilitate research productivity specifically from their pre-tenure faculty, the topic of promotion and tenure came into play. The data revealed that the department chairs felt the promotion and tenure expectations had been described and explained to the pre-tenure faculty very clearly. Would the data from the pre-tenure faculty validate or refute this assertion? Jewell said:

It was made clear to me by the chair of the department that my chances of succeeding in my line of work, in research, has everything to do with identifying an area of focus and identifying a group of people with whom I can work to get a grant. The funding

environment is very tough right now. In order to survive as a researcher, you've got to have a family that you, actually you get hired into a family, and so that provides the resources you need until you get your own grant. Sometimes your resources are down but someone else in the family has gotten a grant and so it supports the lab. People who come in and want to do their research alone have a difficult time. Yet, it is ironic because that is what is expected of you, as you go up the ladder in our department, is you not only have to have a group but you have to have your own unique interest within that group. You have got to get funding to support all of this.

Anthony said, "They definitely want you to have your own grants and to be part of a team. My institution has been very clear about the expectations. That is how you will be rewarded. People who whine that they didn't know are not listening." Camille responded, "Sometimes you are listening but they are telling you different things. My chair is pretty clear and lays out the official documents. One of the faculty on my mentoring committee gives me contradictory information." Wedney, who is in his fifth year, knew "without a doubt" what it takes to win tenure because "the college has a 16-page little PDF file they email to us that sort of is a guideline for promotion and tenure and things you need to do. So that's helpful. It lists the various things that you know already from just talking to people and common sense to understand what this job is about. It's nice to have it in a written booklet like that. Plus, it gives you a sort of timetable on various things as far as getting all of your package together for promotion and tenure." Mary felt that the "review process came as a complete surprise to me actually. And when I mentioned the number of publications that I have and that I brought a grant with me, my friends outside of my department were shocked that my chair was not praising me more." Troy agreed that "the tenure

process can be filled with surprises” but felt his chair was “very straight forward and supportive. What [Mary] is saying is true. Different departments have different benchmarks and I trust my department chair to set me straight. He will get me through tenure.” Fellman added, “since we are in a very large department with a lot of specialties, I was worried about tenure. I am in my second year and do not have a grant but I have one pending and am on another one as part of a team. My chair told me I need a RO1. The team grant will help if we get it but I need to get my own. I am really feeling the pressure.” Mattie felt “very sure” about the “whole tenure thing but I am in my first year. I have set an aggressive timetable for getting a grant and really used my mentor at my former institution to help me write it. NIH has it pending now. My chair took a look at it and said it was very strong. He also knew some of the people who review and felt like they would understand the importance of this research.” Alison, at the mid point of her six year appointment, said, “The initial information I was getting from friends in other departments was very wrong. I went to my chair and asked him. He said, talk to your colleagues here. Ask the senior faculty what they expect. Here is what we have asked for over the last five years. What is your plan for funding and how are you going to get there?” The data reveal that there may be confusion when it comes to promotion and tenure and expectations. Some of the pre-tenure faculty were very sure of the benchmarks while others were misinformed or unaware. One issue that department chairs need to concern themselves with is the variety of expectations that may exist at the same institutions. Pre-tenure faculty can and will develop relationships with faculty from other departments. The information and advice that can emerge out of that relationship may be in sharp contrast to the reality of the home department’s expectations.

What Do the Faculty Think of the Chair as a Leader?

The data from the department chairs did not address the notion of the need for a department chair per se, but it was obvious from the comments that the department chairs had no doubt about their value to their units. The data from the pre-tenure faculty address this topic from a different perspective. It is instructional to the topic of department chair leadership in general to listen to their responses. Much of the information revealed in the data suggests the importance of the role of the department chair in the institutional hierarchy. Fellman said,

We had this dean who thought he knew everything and put marks on people. He would only support certain faculty and give money to only the people who agreed with him. Our chair took him on, and he could because our department brings in a ton of money—that is power. So the chair laid out the plan of how this dean could use our department to build a stronger college and presented it to him. He also told him that by playing the favorites game he was alienating other people and could cause us to lose our star [faculty].

Alison felt that her chair “introduced ideas that brought about change.” Mattie agreed and added, “we interact with our chair and so we can exchange ideas and plan better. I feel like the dean is not on our side.” Wedney, prompted by Mattie’s statement said, “it is the chairman’s job to protect us from the upper administration’s arbitrary decisions. I have seen him alter the decision process in our favor.” Troy described a recent reorganization effort at his institution. He was asked to serve as a faculty representative and was able to “witness firsthand how my chair offered the best ideas to reform the plan that had been proposed. [The plan] was bad for departments and actually penalized a super successful department like ours and he brought a fresh perspective that changed the outcome of the reorganization.” Mary noted that the same

chair “is good at smoothing out things when feathers get ruffled, he stays on target and always gets a positive result. He then is able to implement the change and make it effective.” Jewell said, “a good department head makes an invaluable contribution to the institution. It's not a bad job, so long as you come to grips with certain realities. The chair's job is actually to keep the faculty happy, to make changes when needed, and to be the negotiator for the department.”

Anthony was the lone dissenter on this topic noting, “the people at the top with the money make the decisions and we just follow it, we are just faculty and so is our chair.” The data here reveal that pre-tenure faculty attribute value to the role of the department chair. Most of the participants described their department chairs as problems-solvers, advocates, and change agents.

Providing Release Time from Teaching.

An observation by Anthony sparked an interesting exchange. Anthony opined, “I see the senior faculty members taking on extra courses over winter and summer breaks, serving on committees, taking on administrative roles. I wonder whether after tenure I might have to do that, no longer publishing or attending disciplinary conferences but instead stuck on campus teaching summer courses, advising student organizations, doing administrative work.” Jewell, shaking her head in disagreement, said, “That is important too. How are our students going to learn how to do research if not from us? I plan to offer summer institutes in my lab and hope my department chair understands the importance and supports me.” Anthony responded, “I am not saying teaching is not important but being better in the classroom is a byproduct of doing good research and research is important in itself. We trained for it in graduate school, and we have responsibilities not only to our students but also to the academic community and citizens. What we do can save lives.” Camille added, “That is why having a chair that understands that is

important. The chair has to be sure to give us time to do our work.” This data provides an interesting detour from the issue of release time from teaching. The department chairs clearly felt the release time was warranted, and, in fact, the literature supports their reasoning. This material suggests that the pre-tenure faculty understand the importance of teaching although none of them petitioned for additional teaching duties instead of research time.

Little Things

On the issue of collegiality, the data show the department chairs focused on the broad concerns. The data specifically revealed that intense effort was devoted to creating a collegial department. The methods utilized by the department chairs focused on developing a mind set or department culture that was conducive to research productivity. Would the pre-tenure faculty focus on the same things? Would the pre-tenure faculty data validate the response from the department chairs? One of the more interesting themes that emerged from the data is the idea of department chairs making sure to take care of the little things. I asked the pre-tenure faculty to give me an example of how they were welcomed into their current department on their first day. The responses were interestingly diverse. Mary met my question with a blank look and silence. I asked if she got an office key. She replied, “No! It took me weeks to get one.” Troy added, “I didn’t see my chair that first day, so I walked into labs and introduced myself.” Mary said, “I didn’t have a desk either. At my last job there was someone assigned to initially show you where to park, show you where the keys are, the bathrooms, how to get in and out of the building.” Troy added, “that makes a difference and sets a nice tone. But I made some friends on the first day.” Mary said, “It is sometimes the little things.” Troy agreed, “It is definitely the little things.” None of the others had a negative first day but some were not normal. Fellman

remembered “going to the wrong building and walking into a cadaver class. That was funny. Once I found my building, I had a fruit basket waiting in my lab, very nice touch.” Alison tried to get an early start by moving into her lab the night before her first day and “the police showed up in my lab. They were very nice and actually made me feel safe. The next morning I used the story as an icebreaker. The chair showed up with a small group of faculty and staff.” Mattie remembered “having tons of people come through my lab all day. Some brought me little gifts, coffee cups with the institution’s logo and mascot stuff. I found out later that the chair had sent an email to remind everyone to welcome me. He still does that.” There were also recollections that were more mundane. Wedney said, “the whole interview process was fabulous, I really enjoyed it. Everything was just terrific. I got a few emails and a few drop-ins during the day” Jewell said, “I was already here in a post-doc position, my position kind of segued into assistant professor. It is a model they use here. But the faculty did congratulate me and I could sense a difference that first day. I don’t know but it felt like they were talking differently to me. Not that I was mistreated as a post-doc just maybe more respect?” The “little things” that served to build departmental collegiality and a positive climate for the new faculty hires emerged in the data from the department chairs. Some of the situations were planned and encouraged by the department chairs. The pre-tenure faculty experienced a variety of situations that served to illustrate that the “little things” could be credited to serendipity. It could also serve to illustrate that these situations should be institutionalized so that they occur in a more uniform fashion. The pre-tenure faculty certainly responded in a positive way when they did occur.

Comparing the Data Findings

The data provided by the department chairs and the pre-tenure faculty was valuable as independent bodies of knowledge. They take on added significance when the two data sets are compared. The following sections focus on the eight areas of significance for this study and provide a summary of opinions from the department chairs and pre-tenure faculty, treating each as an identified group.

Mentoring

The data reveal there is general agreement on the topic of mentoring. The department chairs and the pre-tenure faculty both felt that mentoring programs were valuable and effective. In addition both groups felt that it was critical for the department chair to maintain an active role in the process both in monitoring and in personal contact with the pre-tenure faculty. The department chairs only utilized the traditional model of mentoring where a three person team of senior faculty is appointed to assist the new faculty hire. The pre-tenure faculty were much more diverse in their selections and actually embraced some of the newer models of mentoring including peer group and requesting changes be made in the composition of their mentoring team. In the end, the pre-tenure faculty found a way to make the mentoring relationship work for them even if it meant creating an entirely new team on their own. Department chairs should remain open to requests for membership changes. The pre-tenure faculty also noted that it was very important to receive active, ongoing guidance from their mentoring team and the department chair.

Benchmarks and Expectations

The department chairs were adamant that all of the new hires were sufficiently informed about the expectations of the department. The chairs mainly utilized a repetitive method and the data show that the message was supposedly given to the new hires from the leadership, the other faculty, and the official documents of the institution. While some of the pre-tenure faculty acknowledged the existence of a written policy, some were still confused about the benchmarks they were expected to meet. One source of the confusion emanated from faculty that connected with colleagues that worked in other units of their institution. It became clear that different units have different expectations and any pre-tenure faculty would be wise to only consult their department chair and senior faculty when it comes to promotion and tenure expectations. Both groups emphasized that open lines of communication were key on this topic. The department chairs discussed the need for them to educate members of their units about the varying benchmarks that are acceptable in the sub-disciplines of the life sciences. This was an important factor since none of the departments in this research study had less than sixty faculty in them. The data from the department chairs revealed an instance where the written and verbal material differed substantially. This should serve as a caution to all pre-tenure faculty to discuss the process and expectations with their department chair. In addition, institutions should be reminding all of their units that written policies are the rule and not the exception. Deviating from this practice could open the institutions up to litigation. This topic clearly provided one of the few instances of tension in this study. There was mild disagreement over the manner in which the promotion and tenure expectations has been explained. In a few instances, the pre-

tenure faculty did not seem to have a clear idea of the expectations and that could lead to problems for them in the near future.

Independent Yet Interdisciplinary

New hires are urged to begin to establish themselves as quickly as possible as independent scholars with active labs and research findings produced under their watch. In this study, all of the pre-tenure faculty had moved into their current positions from a post-doctoral position. Department chairs strongly suggested that the new hires cut the current ties with their major professors as soon as possible but warned them to do it in a way that allows them to return to that partnership later. This idea is solid as the returning junior faculty can negotiate from a better position of power, perhaps near-equal footing, once they have established their independence. The data reveals agreement on the topic of interdisciplinary teams. The problems in the biological sciences are complex and multifaceted. They often require specialists from a variety of sub-disciplines in the life sciences. The department chairs reported that they encouraged new faculty to join a research team as quickly as possible. The pre-tenure faculty repeated that message and noted that it was not only logical but beneficial to them as they began to discover answers to some of life's most difficult problems. The pre-tenure faculty also understood the need to become an independent scholar.

Protective Interventions

The department chair definitely exhibited a need to protect their new faculty hires from several issues including service on committees. The data revealed that the department chairs stressed that the new hires should focus on establishing their research programs first. Once tenure was achieved, the department chairs felt the faculty could then begin to work on service

projects. The pre-tenure faculty data also suggested that they preferred and even expected to have their department chairs run interference for them in relation to service requests. The overlooked aspect of this topic is the networking opportunity the new hires may have missed by staying isolated in their home departments. Frequently, a valuable mentoring opportunity emerges when junior faculty interact with colleagues from across the campus. In addition, service on committees will frequently expose faculty to colleagues from a diversity of disciplines.

Hiring Practices

There was general agreement between the two groups that the tone of the hire is set in the search process. Both groups expressed the importance of a healthy mind-set that creates a culture conducive to productive work. The department chairs focused on a specific strategy they utilized to create effective departments. This strategy concerned the use of cluster hiring in the departments to create four or five divisions of excellence with a critical mass of faculty “stars” that drive the production both in terms of external funding and scholarly productivity. In addition, the data was clear that each hiring decision was made on the basis of research needs and opportunities rather than meeting teaching demand or replacing retirees. The pre-tenure faculty were less aware of this process or did not discuss it at all. Their focus was more on what I have described as the “little things.” Department chairs would be wise to realize that the new hires are looking for a welcoming, collegial environment that additionally meets their financial, equipment, and space needs.

Department Chair Qualities

This topic produced different responses specifically because of the nature of the topic. The department chairs were providing a self evaluation. The pre-tenure faculty were describing good leadership in general but their comments were colored by their department chair. The department chairs were drawn to the position of leadership by the need to build something; they were called to lead. This evokes an image of an architect or pioneer and some of the terms used by the pre-tenure faculty recalled the same images. In addition, a few of the department chairs had experienced early obstacles that they were able to overcome in order to lead their unit to greater productivity. The data reveal that the pre-tenure faculty wanted a strong leader, someone who would advocate for them and advance the department. In addition the new hires thought a department leader needed courage and vision. The commonality in the data here is that both groups denoted specific traits that they felt were required of a good leader. It signifies that the leader is special or different and takes on a different persona when called to lead.

Building Collegiality

Creating a cultural mind-set that establishes excellence as the benchmark can be difficult. The six departments in this research study have achieved excellence in terms of research and scholarly productivity. They continue to attract productive researchers because of their reputation in these and other areas. One of the most important areas is the climate of the department itself. The idea of collegiality evokes images of nirvana. While this may not be realistic, the departments in this study have an additional need for collegiality. The problems in the life sciences are very complex and require multiple answers. The pieces of puzzle lie in various sub-disciplines that must come together for the solution. Some of the institutions in this

study have institutionalized the concept of collegiality. In addition, they celebrate success with social events, retreats, and monetary rewards. They also discourage non-collegial people from remaining at their institutions. The pre-tenure faculty were certainly in agreement with this concept of collegiality. They noted that it was important to build relationships and that the communication within the unit be open and honest. Almost all of the pre-tenure faculty found retreats to be a good use of time toward building a collegial department.

Fully Engaged Leadership

Again, this topic was not addressed in the same manner by the two groups. The department heads insisted that the job of a unit head in the biological sciences is a full-time endeavor. Each had served as a researcher earlier in their career, some were sad to give it up, but all agreed that it was necessary for success. In addition, they noted that they could turn their attention to writing grants for the greater good of the department, something that the pre-tenure faculty echoed as being important. The pre-tenure faculty also agreed with the axiomatic opinion of the unit leaders that the role of the department chair is important and significant. In fact, many of them explained that the department chair was instrumental in their personal success and continued productivity.

Chapter 6: Discussion

The purpose of this research was to discover the methods used by department chairs of highly successful biological science departments to facilitate research productivity in their pre-tenure faculty. The conceptual framework for studying the topic of department chair leadership used in this study was Matusak's (1997) framework of core values designed to facilitate organizational prosperity: (1) releasing human potential; (2) balancing individual and group needs; (3) defining and defending fundamental values through internal and external community; and (4) instilling and facilitating initiative and responsibility at all organizational levels. A constructivist grounded theory approach was used as the theoretical framework. Charmaz (2006) notes that the constructivist approach “places priority on the phenomena of study and sees both data and analysis as created from shared experiences and relationships with participants and other sources of data” (p 130). The how and why of the meanings and actions taken by the department chairs in specific settings are the focus of this study. Because the study focuses on how department chairs lead, the constructivist approach creates a strong theoretical framework from which to work. This study looked at a subset of department chairs and pre-tenure faculty and explored three questions:

1. What are the methods that department chairs of highly successful biological science departments employ to facilitate junior faculty research productivity?
2. What are the methods a department chair may employ to create a positive climate that leads to a productive department as measured by external funding and scholarship publications?

3. What do pre-tenure faculty believe about the role of the department chair in facilitating their research programs?

The answers to these questions help to validate some of the existing literature and will expand the research in the sub discipline of department chair leadership, especially in the biological science area. In addition, it provides a qualitative perspective to broaden the conversation about facilitation methods used to enhance scholarly output.

Summary of Findings

There were four main findings related to department chair leadership that emerged from the data that could be useful to current department chairs. More importantly, the three research questions were not only answered but provided a wealth of data that are valuable to the area of department chair leadership. First, department chairs that lead successful biological science units focus on the task at hand on a full-time basis. The six successful leaders in this study devoted their time to leading their respective departments, even if that meant limiting their research productivity. Second, successful department chairs are concerned with maintaining departmental collegiality. The six chairs in this research described several methods they used to create or enhance a culture that provided a positive climate. This allowed these six departments to recruit, hire and retain highly productive faculty members. Third, the success of departments was linked to the success of the institution. Each of the institutions in this research enjoyed a positive reputation but also maintained their prestige on the national level by obtaining large amounts of external funding and producing a high number of scholarly publications. Both the funding and publication systems are built on a peer-review process. This process is rigorous and demands that each of the faculty meet high standards in terms of intellectual and academic prowess.

Fourth, in each of these institutions, the pre-tenure faculty, and in fact the most research active faculty, were allowed to spend more time on their research than in other activities. The teaching loads were lightened for the pre-tenure faculty in this study. Other faculty, who are less productive research-wise, were assigned to teach the classes.

By aligning the findings here to Matusak's framework of core values designed to facilitate organizational prosperity in the demanding social context and financial climate, we are able to see the areas of interface. The framework expressed by Matusak is validated by the data in this study. The department chairs are focused on releasing the human potential in each of their faculty members. The nature of leading a very large department with numerous highly intelligent people is a daunting task. Each of the department chairs in this study were able to balance the individual and group needs. In addition, they were able to create a climate that encouraged collegiality. The values of the department chairs and pre-tenure faculty in this study revealed by the data focus on the concept of discovery. The faculty were involved in trying to solve very complex biological problems. The department chairs were involved in providing the best environment to allow that discovery. Although not a specific component of the research protocol, the fundamental values of the departments are clear to the internal and external communities; namely that the research conducted in these labs will help to overcome some of the world's most troubling problems. Finally, the department chairs realized that the success of the department could only be maintained or enhanced if the body of faculty were empowered to aid the process. The department chairs in this study did facilitate responsibility and initiative in multiple ways; namely mentoring, evaluation, retreats, and informal gatherings.

Important to remember is the particular disciplinary context of the study. Because the research examined highly successful life science departments, it makes it difficult to generalize the results to other disciplines. This was done intentionally for the reasons stated before; namely, the importance of the research for public health benefits, the expense of the research efforts, and the availability of external funding. Disciplines with similar factors at play could expect the same results if they implement the strategies and methods employed by these department chairs. Department of English or Political Science do not share the same opportunities and so the parameters would need to be altered to perform a study in those disciplines.

Focused Discussion of the Research Findings

This study was concerned with discovering if there are facilitation methods that department chairs can use to create more research and scholarly productivity from pre-tenure faculty. Six ideas clearly emerged from the data that either build on the existing literature or expand the field or both. The department chair's role in the success of the department and, more broadly, the university is important and measurable. A fully engaged leader is required for highly productive departments as shown in these six models of excellence. The success of these six departments depended heavily on the faculty and this opportunity was created at the onset with the recruiting and interview process. The skill set required of a department chair in a highly successful biological science department must include a broadened awareness of the various sub-disciplines. The department chairs ability to motivate their faculty was clearly linked to the development of a culture that could create a positive mind set. The issue of research versus teaching has clearly been resolved in the departments included in this study.

Importance of Department Chairs

Department chairs are integral to the success of an institution. The data from the department chairs in this research validate the assertions of Gmelch and Miskin (2004) that department chairs play a crucial role in higher education. The data illustrating that assertion was repeated numerous times by most of the pre-tenure faculty. Although, at times, the pre-tenure faculty shared their disdain for administrators (deans and provosts), they recognized the department chair as the leader most needed for a successful biological science department. Alison opined, “our department chair has single-handedly taken this unit to a new level, even in the face of poor leadership at the provost level...by focusing on how to keep moving forward, improving, building this tight knit family atmosphere and leading, he has made a difference for us.” In addition, the data here revealed a connection to leadership and decision making which validates research by Roach (1976) that estimated 80 percent of all university decisions are made at the departmental level. Mattie said, “our chair has stuck to the plan that we all helped to develop and he is a true leader. We have sustained our excellence because he is willing to think long range ideas and push for us.”

This study also continues to emphasize that planning for succession after a department chair steps down is vitally important. Deans and higher administrators may want to have senior department chairs mentor others and plan for their retirements. Succession planning is part of the culture of corporate life. Many corporate CEOs are asked to provide the names of two or three people at the company who could step in tomorrow to fill their shoes — not just in an emergency but as a permanent successor. In colleges and universities this situation is rarely discussed. It certainly did not appear in the current literature. Higher education institutions today should be

very concerned about succession planning in academic departments in general but specifically in high stakes disciplines like the biological sciences. Serious thought is being given at many institutions to maintaining the continuity of departments as retirements loom. In addition, the existing literature noted the current lack of training opportunities for department chairs (Edwards, 1999; Berquist, 1992; Seagren, Creswell & Wheeler, 1993). Institutions should create professional development programs and work to develop career plans for faculty who aspire to positions of leadership by providing appropriate professional opportunities and a clear path for upward mobility. This study validates the need for both of these activities. As the competition for funding continues to tighten, the important roles that department chairs play will only grow.

It is important to remember when examining the results of this research project that the outlook is very optimistic. This might be due to many factors related to the specific people in this study, the departments represented, or the nature of the research design. Further study related to the career development paths of the six highly successful department chairs or the external funding history of the six institutions could reveal another factor in this research. Some of the current success may be due to the past success of the departments studied. In addition, a study could be designed that removes the leadership effect from the department which might reveal additional factors as well.

Fully Engaged Leadership

The current literature did not explore the idea of fully engaged leadership. This form of leadership requires commitment, focus, and support. Fully engaged leadership asks the leader to put aside her/his other interests in research or teaching for the benefit of being able to focus on the task at hand, leading the unit. The data from this study indicate that a work week is not easily

defined or demarcated. St. Cyr said, "I have to keep my department at the top. You can't get there by working half a day." This study revealed that the majority of the department chairs felt that they had to put their research career aside in order to be effective as a leader. This has serious ramifications for their research careers. Jarreau noted, "Some folks say that not having a research program disconnects me from the other faculty. That obscures the fact that in most cases, we administrators share the exact same values and goals as faculty members." In addition, the chair is called upon to serve as a link between the upper administration and their home departments, which are very large and diverse. Communicating effectively with a minimum of sixty people is a very time consuming responsibility. Anthony said, "The chair is a connector, he puts people together in a good way." The existing literature about the role of the department chair in higher education clearly notes that stress is a major deterrent to effective leadership (Dill, 1984; Wolverton, Gmelch, Wolverton, & Sarros, 1999; Gmelch & Burns, 1993). What the current literature did not explore is the toll that serving in this position of leadership can have on the chair's research career. Fontenot said, "I made the tough decision to lay aside the research program for now. And the stressful thing is that it affects other lives and sometimes that makes me mad." The combination of these stressors can lead to burn out and exhaustion unless the leader is able to operate in a role that is clearly defined. McAdams (1997) theorized that large departments may run more efficiently with associate chairs or department coordinators. The data from this study found that several of the department chairs utilized this system by appointing division leaders for the various sub-disciplines which validates the previous theory. This study introduces the concept of fully engaged leadership as it pertains to the department chair position.

Recruiting Process is the First Step

It is not surprising that the success of these highly productive departments is fundamentally based on the hiring of smart, successful faculty members. The faculty pool is drawn from the best universities in the world. In a shift away from the traditional hiring practice, often times the universities in this study are hiring their own graduates. Braud, stated, “we are producing the best graduates in our concentration area and we tend to keep them here, the comfort level and the team building and development are set, so the environment is fertile for productivity.” What is unique in this study, is that the data revealed the recruiting procedure was clearly identified as a process that could be used to improve the department. It was not merely a method that allowed each department to fill a teaching need or replace a lost colleague. Each hire was identified using established criteria related to a strategic plan. The process was successful because of the history of success. In addition, the key component to the success of this process was the department chair’s leadership. St. Cyr said, “faculty recruiting is a process we go through...it’s a very important factor really in developing a department.”

Special Skill Set Required

The department chairs in this study indicated that they were required to develop an understanding of the importance of research outside of their sub-disciplines. This may seem to be a logical assumption but a closer examination of the path a faculty member takes is needed. The first position all of these department chairs took after completing a Ph.D., was a post-doctoral appointment. This was followed by obtaining a tenure track position at an academic institution. Once they were hired, they progressed along the promotion and tenure track. All of this progression was predicated on their being successful at establishing themselves as an

independent researcher competent in a sub-discipline in the biological sciences. This intense journey required that they focus their energies on becoming the best researcher in the narrow field of study they had chosen to the exclusion of others. It required that they devote countless hours on journal articles and research experiments as well as attending professional conferences to stay abreast of the latest developments in their narrow field. This path is not specific to the biological sciences; many tenure-track faculty take this path. The twist occurred when the faculty member decided to assume the department chair position. This decision required a new skill set, and required that the department chair be a generalist in the sense of being able to recognize excellence and acceptable benchmarks across the broader discipline. In addition, they had to be able to translate the different expectations and nuances of the various sub-disciplines to their faculty members in order to maintain fair and equitable promotion and tenure practices. The data here validate Bensimon, Ward, and Sanders (2000) assertions that transitioning into leadership requires understanding organizational nuances and being able to build and sustain relationships. The data reveal that the department chairs in this study understood the complexities of good leadership and the importance of communicating the departmental expectations and norms to everyone. The data in this study confirms Higgerson's (1996) assertion that virtually every task assigned to department chairs requires effective communication skills. What had not been discussed in previous literature was the need for department chairs to be adept at evaluating the multitude of sub-disciplines that abound in the life sciences. That is one of the reasons this study was performed. It became clear to me that there were subtle nuances that required different skills on the part of faculty who want to assume a leadership role in the biological sciences. A dean or director who is searching for a department chair of a biological science or any large, varied

department would be wise to ask probing questions of their candidates to discover if they possess this valuable skill. It is essential to leading a department with highly productive faculty.

Motivation Linked to Culture and Mind Set

The data determined that the department chairs also needed the ability to motivate their faculty to be successful and productive. The literature on department chair leadership has been clear that candidates for this position should prepare themselves for the multiplicity of tasks (Bennett, 1983; Bergquist, 1992; Edwards, 1999; Gmelch, Burns, Carroll, Harris, & Wentz, 1992; Howard and Green, 1999; Seagren, Creswell & Wheeler, 1993; Tucker, 1984). My study expands the discussion to include the topic of motivation. The department chairs credited the success of their department to the culture and climate that existed. The data reveal they were able to bring a very large group of people together around common goals and shared values. This data was in contrast to Lindholm's (2003) research that noted how many faculty in large departments (and within an even larger university work environment) said it was virtually impossible to have a sense of shared values about much of anything, other than at a very abstract level. In addition, their commitment to mentoring committees, faculty development programs, retreats and social events, and most importantly, serving as an advocate for the faculty were key components that helped the department chair create a positive environment. Finally, the department chairs were careful, in many instances, to link the motivation factors of the faculty to the overall goals of the institution. This data on motivation validate Gardner's (2004) assertion that one of the keys to leadership that effects a shift in culture is changing the minds of others. Although this study does not offer a prescriptive strategy on how to accomplish this difficult task, it does offer insight into how the climate and culture can help attain this goal. The data reveal several instances where

peer pressure from colleagues who were committed to a certain paradigm encouraged those in disagreement to move on to other institutions. The department chairs also modeled the behaviors that they were trying to promote. No one complained that the department chair was asking for something that was not also expected of the leader. In fact, there is data that illustrates that the department chairs held themselves to the exact same high standards and expectations as they expected from their faculty. Alison noted, “he will not back down when it comes to holding everyone to the benchmarks we set and he gets called on those as well. He knows we are going to measure his progress like he measures ours.” This climate aided the creation of a positive mind set that permeated the entire department.

Teaching Versus Research

An issue that has generated a good amount of discussion as of late is the tension between the time devoted to teaching versus scholarship in a research extensive institution. I included material on this topic in the literature review and the chairs and faculty discussed the issue in their interviews. The data reveal that most department chairs felt compelled to relieve the teaching duties of their pre-tenure faculty. St. Cyr said, “I have to give more time to research and less time for teaching.” In this way, the new hires were free to focus on developing a rigorous research program. The data did not indicate that it was a contentious issue within the departments studied here. In fact, when queried, the department chairs noted that the additional teaching load was assigned to more senior faculty in most cases. Nor did the pre-tenure faculty complain about the lighter teaching loads. A negative revealed in the study was that by not teaching, the new faculty were less likely to be involved in graduate student recruitment as heavily as they would like. This related to the pre-tenure faculty’s inability to recruit graduate

students to their institution that could work in their area and thus their research labs. Again the data here did not offer a prescriptive response to this issue. In fact, it is not a problem in most instances. That can be construed to have meaning as well. As Marsh and Hattie (2002) have noted, teachers who are active researchers are more likely to be on the cutting edge of their discipline and aware of international perspectives in their fields. Perhaps the data is asserting that because the research in the life sciences usually requires an interdisciplinary approach, the team concept described by the department chair and faculty extends to the classroom as well. The faculty are meeting to discuss the research projects they are involved in and in the course of that discussion, they are also describing methods and ideas that can be shared in the classroom. The discussion about the research problems serves as a conduit for new and innovative ideas for the classroom. Tierney (1998) notes that at many colleges and universities, the rewards for research have become considerably greater than those for other activities. That concept is certainly validated by the data from this study. Fontenot explained, "We use incentives to spur research in certain areas." Admittedly this research study was focused on research productivity and scholarly output as the measurable outcomes, but the department chairs said nothing to impeach the idea that Tierney is advancing. In the life science disciplines, research is arguably the most important function and it certainly informs the teaching.

Implications and Recommendations

Implications for Theory

The data from this study on the factors that motivated each department chair to assume their leadership positions was informative. As previously discussed, the department chair's job is difficult and filled with stress. Those two factors alone serve as deterrents for many who might

seek the position. But the drive to build a unit of excellence and to help others in the process motivated the six department chairs in this study. This data validate the core values in the conceptual framework I used to shape this study. Matusak (1997) theorized that organizational prosperity could be facilitated by: (1) releasing human potential; (2) balancing individual and group needs; (3) defining and defending fundamental values through internal and external community; and (4) instilling and facilitating initiative and responsibility at all organizational levels. Matusak believes that leadership is about leaving a mark by initiating, guiding and working with a group of people to accomplish change. While the department chairs in my research may have been unaware of Matusak's work, the data they provided validate this important theory.

The motivation of the department chairs revealed in the data reenforce Matusak's first tenet related to releasing human potential. In fact, this entire study focused on the importance of facilitating the efforts and success of others. In addition, balancing individual and group needs was a major factor in the six highly successful departments studied in this research. Matusak's second tenet emerged clearly during discussion with the department chairs and the pre-tenure faculty. In this study, the fundamental values that Matusak describes in his third tenet could have been the decision process and subsequent follow through related to the focus areas for the departments and then the hiring strategies. The department chairs clearly had to build support for the focus areas selected and had to withstand criticism and dissent from faculty who may have felt disenfranchised by the new structure.

It was also apparent that something else was going on that was having an impact on the departments which relates to the fourth tenet of Matusak's theory. The department chairs were

using an inclusive leadership style to enhance the excellence of their units. Inclusive leadership is one that focuses on valuing others, encouraging honest communication and team building. It is exhibited in this study by the leaders who changed a mentoring committee when the mentee felt uncomfortable, by intentionally avoided taking minutes to encourage an open discussion, or by sponsoring retreats so that faculty could provide input on their future. It is a style of leadership that respects the diversity of ideas within the parameters set by the department that should occur in an institution of higher learning. It also appears to be effective at dealing with the politics of exclusion. By allowing the different views that faculty bring to a very large department and subjecting ideas to critical scrutiny, a new paradigm may emerge as a model for leadership in higher education. The inclusive leadership style can be used to illustrate Matusak's ideas about instilling and facilitating initiative and responsibility at all organizational levels. The next logical step in these highly successful departments would be for the faculty to emulate this model within their own labs, including their research staff and students.

Turning our gaze to the faculty in this study, the existing literature was also enhanced and validated by this research. Hollander and Offerman (1990) found that by sharing power and allowing followers to influence them, leaders can foster leadership skills in others, as well as achieve other gains through their greater participation and involvement. Their theory of followership from the discipline of psychology was certainly validated by this research study. The data reveal that the followers in this instance, the faculty, did have an impact on the leaders. The department chairs, by fostering leadership development in others, were able to achieve their goals involving external funding and scholarly output. In addition, many (Gmelch, Lovrich, & Wilkie, 1986; Rice, Sorcinelli & Austin, 2000; Sorcinelli, 1992; Tierney & Bensimon, 1996)

have asserted that the promotion and tenure process in higher education is a major source of stress for new hires and the data here certainly validates that declaration.

Productivity and mentoring has been linked in the existing literature (Cohen, 1995; Daloz, 1999; Wright & Wright, 1987). The data revealed in this study strengthens the assertion that mentoring can be an effective method for increasing outcomes in a higher education setting. While the review of literature about mentoring revealed an abundance of material on the traditional idea of mentoring described in Homer's *The Odyssey* in which a junior, less experience individual is paired with a set of experienced people with the intent of receiving guidance and support (Carden, 1990; Daloz, 1999; Galbraith & Cohen, 1995) it did not provide any information about how many department chairs rely on this method. In addition, the literature revealed new, expanded mentoring models (Anastos & Ancowitz, 1987; Kram & Isabella, 1985, Sparks & Bruder, 1987) but did not address the level of usage among current department chairs. This study allowed exploration of mentoring as a method and additionally allowed a determination of what models are currently being used in these six departments. The data show a clear understanding on the part of the department chairs in this study of the traditional model of mentoring. The data reveal a complete lack of knowledge or mention of any other types of mentoring models on the part of the department chairs. The data from the pre-tenure faculty did reveal the knowledge and acceptance (as indicated by the usage) of the various other models of mentoring (i.e. peer coaching and New Scholars Network).

The literature on faculty roles, rewards and expectations presented a landscape that had a few rocks and weeds. Rice, Sorcinelli and Austin (2000) illustrated that faculty may be confused because expectations may change over time. The data presented here somewhat validated the

previous research in this instance. In a few cases, the faculty were indeed confused about the promotion and tenure expectations. Camille responded, “Sometimes you are listening but they are telling you different things. My chair is pretty clear and lays out the official documents. One of the faculty on my mentoring committee gives me contradictory information.” However, the majority of pre-tenure in this study were confident that they knew what was required of them in order to obtain tenure. The expectations were ingrained into the culture of the department. Anthony said, “They definitely want you to have your own grants and to be part of a team. My institution has been very clear about the expectations. People who whine that they didn’t know are not listening.” Wedney, who is in his fifth year, knew “without a doubt” what it takes to win tenure because “the college has a 16-page little PDF file they email to us that sort of is a guideline for promotion and tenure and things you need to do. So that’s helpful. It lists the various things that you know already from just talking to people and common sense to understand what this job is about. It’s nice to have it in a written booklet like that. Plus, it gives you a sort of timetable on various things as far as getting all of your package together for promotion and tenure.” Not only that, they began to understand the expectations as early as graduate school but more often in their terms as post-doctoral appointments. In addition, conflicts between institutional rhetoric and the realities of reward structures, and the emphasis on research to the detriment of teaching and service in promotion and tenure decisions have been identified as major sources of stress and dissatisfaction in probationary faculty (Gmelch, Lovrich, & Wilkie, 1986; Rice, Sorcinelli & Austin, 2000; Sorcinelli, 1992; Tierney & Bensimon, 1996). The data here disagrees with the existing literature in this area. The department chairs devised their unit’s structure to accommodate research opportunities for the

pre-tenure faculty. Fontenot noted that successful faculty may receive “bonuses” or “salary enhancements.” Later he explained, “I am big fan of incentives, if you can create incentives you are going to get people working harder and working more, incentive programs are terrific. We use incentives to spur research in certain areas.” Several of the institutions that housed these highly successful departments had internal grant funding to encourage research. In addition, researchers received release time from teaching. Blouin illustrates this point by noting, “for the research-oriented faculty, the first couple of years are very light on teaching.” The pre-tenure faculty understood that they were going to be rewarded for performing research. Alison, at the mid point of her six year appointment, said, “Here is what we have asked for over the last five years. What is your plan for funding and how are you going to get there?”

In addition, the data reveal that a collegial department was enhanced by “little things.” While the department chairs determined that social events and retreats were the best methods for building collegiality, the pre-tenure faculty focused on more personal occurrences that took place very early in their careers. The data from the pre-tenure faculty described instances, both positive and negative, that came to be described as “little things.” Often, with the pressure of competing for external funding, building endowments, administering a large department and dealing with multiple priorities, the human side of leadership can get lost. The data support that department chairs should be concerned about social events or award ceremonies but should not overlook the “little things” like welcoming a new colleague on their first day, making sure the new hires receive keys to their offices and labs, or having a fruit basket waiting in the new hire’s lab on the first day. One of the best suggestions that emerged from the data came from Mary, who said, “At my last job there was someone assigned to initially show you where to park, show you where the

keys are, the bathrooms, how to get in and out of the building.” It may sound obvious but it can make a difference in how faculty think about their new institution. Mattie remembered, “having tons of people come through my lab all day. Some brought me little gifts, coffee cups with the institution’s logo and mascot stuff. I found out later that the chair had sent an email to remind everyone to welcome me. He still does that.” Boice (1993) found that the patterns of collegial isolation/neglect, collegial disapproval, self-doubts about competence and feelings of victimization and suspicion among disillusioned mid-career faculty often have their origins in pre-tenure incidents. The data here validates and expands this concept.

Implications for Practice

The literature review discovered several scholars (Bok, 2003; Oblinger & Verville, 1998) who offered the idea that because there are some similarities between the mid-manager position in the corporate world and the department chair position in the academic realm, that higher education institutions should seek to emulate their colleagues from the business side. The literature on department chair leadership is becoming more sophisticated and broader in terms of exploring other models. As I was conducting this research study, several new books have been published on the topic. One of the trends that I see emerging is a tendency to link what a department chair does to what a mid-level manager would do in a corporation. While it is easy to make the comparison, I find similarities myself, it is also very important to avoid grouping the two positions together. A university is not a business no matter how many times elected officials and quasi-educationalists make the case. A university is a place for people to come and develop critical thinking skills while exploring their future. It is a time for people to develop themselves more fully, whether intellectually, spiritually, emotionally or, hopefully, a combination of all

three. It is the precursor to getting on with your life. It is the pretest for the real world. It is a time for inquiry, inquisitiveness, questioning, exploring, and perhaps indulging in all that life has to offer. That is why faculty are not merely employees and students are definitely not customers. You cannot buy knowledge in a package. It must be experienced. That is why a department chair is not simply a manager. There is no way to manage creativity, discovery, and exploration. There is no way to manage a free flow of ideas that promote informed exchange and debate. So while I would definitely encourage universities to devote more effort and financial support to leadership development at the department chair level, the training and workshops should not be crafted at the local corporation. They should emerge as all knowledge does, with the power to transform, with passion, with vision. After all, knowledge has always been about opportunity. The data in this study did not link higher education to the corporate world. The department chairs described leadership in terms of academia. The benchmarks are discovery, not profit. They spoke of solving the world's most deadly problems rather than share holder equity. The data here supports the results of previous research by Herzberg (1959), McInnis (2000), and Morello (2000) that asserts that knowledge workers are motivated by the inherent stimulation of the work itself and value a capacity to finish the task, autonomy in task and to work with interesting individuals.

Recommendations for Practice

Two ideas that emerged from the data are offered here in a more fully developed form. There was much discussion about how the culture and climate of the departments were enhanced by the hiring strategies employed. In most instances, the department chairs had selected, through various processes, three to five sub-disciplinary focus areas. I used this framework to propose a cluster hiring strategy. In the second instance, a close examination of the roles and

responsibilities of the department chairs revealed a potential for stress or burn out. Because of the importance of the department chair in maintaining highly successful department, providing a mechanism for rejuvenation would prove beneficial.

The practice of cluster hiring being used strategically to build departments of excellence is an idea that has been around for the last decade. The technique was certainly at play in the six departments studied for this research project. The department chairs in this study used the concept of developing four to six clusters of excellence. A cluster in this instance was a grouping of faculty around sub-disciplinary research areas. This relates to the original research questions because it identifies a strategy that is used to enhance the climate and the opportunities for success for all faculty members but perhaps more importantly, for the new hires. A candidate would find an opening in any of these six highly successful departments to be a great opportunity largely because there is a waiting team of productive colleagues. By implementing this strategy used by the highly successful departments, I feel strongly that aspirational departments could begin to improve on their research and scholarly output. By taking it a step further, limiting hires to senior faculty only, the impact could be more immediate and productive. The idea of cluster hiring in this instance could be tailored to each institution's current strengths. By adding a small group of four to six key hires in a targeted area, these universities could make advances up the hierarchy of research institutions. By modifying the strategy to only focus on senior hires, I feel the progress would be more rapid. A university that makes the financial commitment to hire four to six full professors in a research cluster area would benefit in several ways. First, the new hires would generally come to the new institution with external funding and fully operational research labs along with post-docs and students. This additional funding and activity will instantly

improve the output ratio of the institution. Second, the senior hires are more likely to be serving on national panels, editorial boards of journals, and holding membership in national academies. This type of affiliation and prestige is factored into the various rankings done by the National Research Council and other entities and will immediately add value to the institution itself. Third, the message sent will be clear. The institution will be seen by its peers as making a statement that research is highly valued at the institution. While not without controversy, the institution that implements this strategic model will begin to show benefits very quickly. It can then use the indirect costs recovered to make additional cluster hires, improve facilities, and fund internal grant programs aimed at the general faculty population. This return on investment could appease many of the initial critics expected at the start of something this radical. In addition, I realize that this more radical version of the strategy used by the highly successful departments strays a bit from the original focus of the study but is clearly linked to department chair leadership. As explained previously, both in the literature and evidenced by the data, the department chairs are making the hiring decisions. In addition, the data illustrate that department chairs are also performing strategic planning to ensure a structure that supports scholarly productivity. This model combines the two functions.

The data here clearly validate the existing literature that relates to the importance of the department chair in the success of the department and the university as a whole. Leadership to build, enhance, and maintain a highly successful department requires a leader who is energized. In addition, the leader must be able to access a broad array of training and professional development opportunities. All the more reason for the supervisors of the department chairs to explore opportunities for rejuvenation and reinvigoration. Replicating the academic model

already in place for faculty, institutions would be wise to institute a sabbatical program for department chairs. The leaders who serve a certain amount of time, say five years, could be given a semester off. In this sabbatical time, they could be encouraged to explore professional development workshops. In addition, they could use the time to become familiar with new and innovative leadership methods that they could implement once they have returned from the sabbatical.

Recommendations for Future Research

There are several ideas that could be explored in future research projects that would build on or enhance the findings of this project. The most significant suggestions include:

- * This research study was concerned with the discovery of facilitation methods that department chairs used in highly successful life science departments. An interesting contrast would be to interview department chairs in less successful departments. It would be interesting to compare the data from either a group of very low performers or a group of aspiring performers against the findings of this study.
- * A qualitative study designed to capture information from the deans or supervisors of these department chairs would also be interesting. The study could be targeted to extract data from the dean participants on why they think the department chairs are successful, what mentoring they are providing to the chairs, and how they feel department chair leadership can be enhanced.
- * It would be useful to generalizability and useful to the research area of department chair leadership to replicate this study in other areas of the university. A similar study designed to focus on an engineering discipline or perhaps something in the arts, humanities or

social sciences would provide researchers with more data about the role of department chairs and their influence on faculty productivity.

Final Thoughts

If nothing else, this study solidifies the fact that department chair leadership matters. The department chairs performing the roles obviously think so or they would not be spending their time in this stressful position that requires the mental capacity and endurance to operate in a pressure filled situation. It was clear from their comments that they had all enjoyed their life as a faculty member and research was a passion for each of them. The pre-tenure faculty did not equivocate on this matter. The general consensus was that the success of these departments, their institutions, and in many instances, their personal success, was a consequence of a strong, intelligent department chair.

Secondly, it appears from the data that there are methods that can be implemented to effect a change. By working to create a culture and climate that is conducive to success, the department chairs were effective. The ability to sustain this success over an extended period of time is a testament to the benefits of the various methods. Positive environments produce positive results.

Finally, the sub-discipline of higher education leadership is vibrant and complex. There is much work to be done toward fully understanding all of the nuances that come to bear in the process. While we can apply some of the theories from the corporate world, many of the concepts just do not apply to the academic environment. Others may apply but could produce results that are the opposite of what is conducive to teaching and learning. The development of critical thinking skills requires the special environment of academe.

References

- Ackerman, R. H. & Maslin-Ostrowski, P. (2002). *The wounded leader: How real leadership emerges in times of crisis*. San Francisco: Jossey-Bass.
- Adams, E. M. (1997, September/October). Rationality in the academy: Why responsibility center budgeting is a wrong step down the wrong road. *Change*, 29(5), 58-61.
- Altbach, P., & Lewis, L. (1996). The academic profession in international perspective. In P. Altbach (Ed.), *The international academic profession: Portraits of fourteen countries* (pp. 3-48). Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.
- Amabile, T., Hadley, C., and Kramer, S. (2002). Creativity under the gun. *Harvard Business Review, Special Issue*, August, 52-64.
- American Association of University Professors (2004). Statement on corporate funding of academic research. Retrieved on April 18, 2005 from <http://www.aaup.org/statements/redbook/repcorf.htm>
- Argyris, C., and Schon, D. A. (1978). *Organizational learning: A theory of action perspective*. Reading, MA: Addison-Wesley-Longman.
- Armstrong, J. S. & Sperry, T. (1994). Business school prestige—research versus teaching. *Interfaces*, 24(2), 13-43.
- ASHE-ERIC (2002). Internal service: Faculty at work as institutional and disciplinary citizens. *ASHE-ERIC Higher Education Report* 29(5), 51-69.
- Askling, B., and Kristensen, B. (2000). Towards the learning organization: Implications for institutional governance and leadership. *Higher Education Management, OECD*, 12(2), 17-41.
- Association of American Colleges (1985). *Integrity in the college curriculum*. Washington, D.C.: Association of American Colleges Publications.
- Association of University Technology Managers. (1998). *AUTM Licensing Survey FY 1998*. Norwalk, CT: AUTM.
- Astin, H. S. (1978). Factors affecting women's scholarly productivity. In H. S. Astin & W. Z. Hirsch (Eds.), *The higher education of women: Essays in honor of Rosemary Park* (pp. 74-89). New York: Praeger.
- Austin, A. E. (2002). Creating a bridge to the future: Preparing new faculty to face changing expectation in a shifting context. *The Review of Higher Education*, 26(2), 119-144.

- Banta, T. W., Lund, J. P., Black, K. E., and Oblander, F. W. (Eds.). (1996). *Assessment in practice: Putting principles to work on college campuses*. San Francisco: Jossey-Bass.
- Barnard, C. I. (1938). *The functions of the executive*. Cambridge, MA: Harvard University Press.
- Bass, B. M. (1990). *Bass & Stogdill's Handbook of Leadership: Theory, Research, and Managerial Applications, Third Edition*. New York: The Free Press.
- Bauer, M. B., Askling, B., Marton, S. G., and Marton, F. (1999). *Transforming universities, changing patterns of governance, structure and learning in Swedish higher education*. London: Jessica Kingsley Publishers.
- Bavelas, A. (1960). Leadership: Man and function. *Administrative Science Quarterly*, 4, 491-498.
- Becher, T, and Kogan, M. (1992). *Process and structure in higher education, 2nd edition*. London: Routledge.
- Bellas, M. L. & Toutkoushian, R. K. (1999). Faculty time allocations and research productivity: Gender, race and family effects. *The Review of Higher Education*, 22(4), 367-390.
- Bennett, J. B. (1982). Ambiguity and abrupt transitions in the department chairperson's role. *Educational Record*, 63(4), 53-56.
- Bennett, J. B. (1983). *Managing the academic department*. New York: Ace/Macmillan.
- Bennett, W. J. (1994). *To reclaim a legacy: Report on the humanities in higher education*. Washington, D.C.: National Endowment for the Humanities.
- Bensimon, E. M., and Neumann A. (1993) *Redesigning collegiate leadership: Teams and teamwork in higher education*. Baltimore: Johns Hopkins University Press.
- Bensimon, E. M., Ward, K., and Sanders, K. (2000). *The department chair's role in developing new faculty into teachers and scholars*. Bolton, MA: Anker Publishing Company, Inc.
- Berdahl, R., & Holland, B. (1989). *Developing state fiscal incentives to improve higher education*. Paper presented at a national invitational conference of the National Center for Postsecondary Governance and Finance, College Park, MD.
- Berquist, W. H. (1992). *The four cultures of the academy*. San Francisco: Jossey-Bass. (ED 343 539).

- Bert, R. (1999). What do assistant professors want? *ASEE Prism*, May/June. Retrieved on August 6, 2004 from www.asee.org/prism/mayjune/html/asstprof.html.
- Birchard, K. (2004). Canada's billion-dollar controversy: A major attempt to attract research stars has netted few women, leading to charges of bias. *The Chronicle of Higher Education*, January 9. Retrieved on April 8, 2005 from <http://chronicle.com/prm/weekly/v50/i18/18a03801.htm>.
- Birnbaum, R. (1988). *How colleges work: The cybernetics of academic organization and leadership*. San Francisco: Jossey-Bass.
- Black, S. (1972). Interactions between teaching and research. *Universities Quarterly*, 26, 348-352.
- Blackburn, R. T. (1974) The meaning of work in academia. In J. I. Doi (Ed.), *Assessing faculty effort. New Directions for Institutional Research* (Vol. 2, pp. 75-99). San Francisco: Jossey-Bass.
- Blackburn, R. T., & Lawrence, J. H. (1995). *Faculty at work: Motivation, expectation, satisfaction*. Baltimore: The Johns Hopkins University Press.
- Blake, S. (1999). At the crossroads of race and gender: Lessons from the mentoring experiences of professional Black women." In *Mentoring Dilemmas: Developmental Relationships Within Multicultural Organizations*,. A. J. Murrell, F. J. Crosby, and R. J. Ely (Eds.), 83-104. Mahwah, NJ: Lawrence Erlbaum Associates.
- Bland, C. J., & Schmitz, D. (1986). Characteristics of the successful researcher: Implications for faculty development. *Journal of Medical Education*. 61(1).
- Bland, C. J., Weber-Main, A. M., Lund, S. M., & Finstad, D. A. (2005). *The research-productive department: Strategies from departments that excel*. Bolton, MA: Anker Publishing Company, Inc.
- Blau, P. M. (1973). *The organization of academic work*. New York: Wiley.
- Bleiklie, I., Hostaker, R., and Vabo, A. (2000). *Policy and practice in higher education: Reforming Norwegian universities*. London: Jessica Kingsley Publishers.
- Blumenstyk, G. (1998, December 11). Berkeley pact with a Swiss company takes technology transfer to a new level. *Chronicle of Higher Education*, p. A56.
- Blumenthal D., Campbell E. G., Causino N., & Louis K. S. (1996). Participation of life-sciences faculty in research relationships with industry. *New England Journal of Medicine*, 335 (23), 1734-1739.

- Bogdan, R. C., & Biklen, S. K. (1982). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn and Bacon, Inc.
- Boice, R. (1992) *The new faculty member: Support and fostering professional development*. San Francisco: Jossey-Bass.
- Bok, D. (1982). *Beyond the ivory tower: Social responsibilities of the modern university*. Cambridge, MA: Harvard University Press.
- Bok, D. (2003). *Universities in the marketplace: The commercialization of higher education*. Princeton, NJ: Princeton University Press.
- Booth, D. B. (1982). *The department chair: Professional development and role conflict*. AAHE-ERIC Higher Education Research Report No. 10. Washington, D.C.: American Association for Higher Education. ED 226 689.
- Boyer, E. (1990). *Scholarship reconsidered*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.
- Bragg, A. K. (1981, March). *The socialization of academic department heads: Past patterns and future possibilities*. Paper presented at the annual meeting of the Association for the Study of Higher Education, Washington, DC.
- Brainard, J. (2005, November 11). Senate passes bill financing NIH, Pell. *The Chronicle of Higher Education*. Retrieved on December 15, 2005 at <http://chronicle.com/weekly/v52/i12/12a02803.htm>.
- Brainard, J. (2005, March 21). Research council again urges NIH to improve support for postdoctoral sciences. *The Chronicle of Higher Education*. Retrieved March 21, 2005, from <http://chronicle.com/daily/2005/03/2005032103n.htm>.
- Brainard, J. (2004, February 6). What the NIH bought with double the money. *The Chronicle of Higher Education*. Retrieved March 21, 2005, from <http://chronicle.com/weekly/v50/i22/22a01701.htm>.
- Brand, M. (2000). Changing faculty roles in research universities: Using the pathways strategy. *Change*, 32(6), 42-45.
- Braxton, J. M. (1996). Contrasting perspectives on the relationship between teaching and research. In J. M. Braxton (Ed.), *Faculty teaching and research: Is there a conflict?*(pp. 5–14). San Francisco: Jossey-Bass.

- Brender, A. (2004, July 23). Asia's new high-tech tiger: South Korea's ambitious, and expensive, effort to bolster university research is paying off. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/weekly/v50/i46/46a03401.htm>.
- Brown, J. R. (1996). *The I in science: Training to utilize subjectivity in research*. Oslo, Norway: Scandinavian University Press (Universitetsforlaget AS).
- Brown, T. L. (1985). University-industry relations: Is there a conflict? *Society of Research Administrators Journal*, 17, 1-17.
- Brubacher, J. S., & Rudy, W. (1997). Professional education. In L. F. Goodchild & H. S. Wechsler (Eds.) *The History of Higher Education Second Edition*. Boston, MA: Pearson Custom Publishing.
- Bruner, J. (1997). *The culture of education*. Cambridge, MA: Harvard University Press.
- Burgan, M. (2001, April). *The hijacking of higher education*. Address given at Michigan State University, East Lansing.
- Burke, J. C., & Minassians, H. (2002). *Performance reporting: The preferred no cost accountability program, the sixth annual report*. New York: The Nelson A. Rockefeller Institute of Government.
- Burke, J. C., & Serban, A. M. (Eds.). (1998). *Performance funding for public higher education: Fad or trend?, no. 97*. San Francisco: Jossey-Bass.
- Bush, V. (1945). *Science—The endless frontier: A report to the president on a program for postwar scientific research*. Reprinted 1990. Washington, D.C.: National Science Foundation.
- Calzonetti, F. J. (2004). Navigating local economic development expectation at an emerging research university: Raising academic stature vs. rapid local returns. *Journal for Higher Education Strategists*, 1(1), 33-49.
- Campbell, T. I., & Slaughter, S. (1999). Faculty and administrators' attitudes toward potential conflicts of interest, commitment, and equity in university-industry relationships. *Journal of Higher Education*, 70, 309-351.
- Caplan, P. (1995). *Lifting a ton of feathers: A woman's guide to surviving in the academic world*. Toronto: University of Toronto Press.
- Carroll, J. B. (1991). Career paths of department chairs: A national perspective. *Research in Higher Education*, 32(6), 669-688.

- Carroll, J. B., & Gmelch, W. H. (1992, October-November). *The relationship of department chair roles to importance of chair duties*. Paper presented at the annual meeting of the Association for the Study of Higher Education, Minneapolis, MN.
- Charmaz, K. C. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: Sage Publications.
- Chatman, J. A. (1991). Matching people and organizations: Selection and socialization in public accounting firms. *Administrative Science Quarterly*, 36, 459–484.
- Chatman, J. A., & Barsade, S. G. (1995). Personality, organizational culture, and cooperation: Evidence from a business simulation. *Administrative Science Quarterly*, 40, 423–432.
- Checkoway, B. (2001) Renewing the civic mission of the American research university. *Journal of Higher Education*, 72(2), 125-147.
- Chu, D. (2006). *The department chair primer: Leading and managing academic departments*. Bolton, MA: Anker Publishing Company.
- Cohen, E., and Geske, T. G. (1990). *The economics of education*. New York: Pergamon Press.
- Cohen, W. M., Florida, R., Randazzese, L., & Walsh, J. (1998). Industry and the academy: Uneasy partners in the cause of technological advance. In R. Noll (Ed.), *Challenge to the research university*. Washington, DC: The Brookings Institution.
- Colbeck, C. (2002). State policies to improve undergraduate teaching: Administrator and faculty responses. *Journal of Higher Education*, 73(1), 3-25.
- Colbeck, C., Salerno, C., & Moran, L. (1998, November). *Mandated time: Direct and indirect impact of a state faculty workload policy*. Paper presented at the annual meeting of the Association for the Study of Higher Education, Miami.
- Cole, J., & Zuckerman, H. (1987, April). Marriage, motherhood, and research performance in science. *Scientific American*, 256(2), 119-25.
- Colecchia, T. J. (2004, June 25). Colleges and industry: Collaborations that work. *The Chronicle of Higher Education*. Retrieved on April 12, 2005 from <http://chronicle.com/weekley/v50/i42/42b01401.htm>.
- Cook, S. G. (2001). Negotiating family: Accommodation practices on your campus. *Women in Higher Education* 10(4): 25–26.
- Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle Rive, NJ: Pearson Education, Inc.

- Creswell, J. W. (1985). Faculty research performance: Lessons from the sciences and social sciences. *ASHE-ERIC Higher Education Report No. 4*. Washington, D. C.: Association for the Study of Higher Education. ED 267 677.
- Creswell, J. W., & Brown, M. L. (1992). How chairpersons enhance faculty research: A grounded study. *Review of Higher Education, 16*(1), 41-62.
- Creswell, J. W., Seagren, Wheeler, D. W., Seagren, A. T., Egly, N. J., & Beyer, K. D. (1990). *The academic chairperson's handbook*. Lincoln: University of Nebraska Press.
- Daniels, R. (2000). Resisting corporatization of the university. In G. D. White and F. C. Hauck (Eds.) *Campus, Inc.: Corporate Power in the Ivory Tower*. Amherst, NY: Prometheus Books.
- Davies, J. L. (2001). The emergence of entrepreneurial cultures in European universities. *Higher Education Management, OECD, 13*(2), 25-43.
- Deetz, S. A. (1992). Departmental leadership and departmental culture. In M. Hickson III and D.W. Stacks (Eds.), *Effective communication for academic chairs (pp. 1-22)*. SUNY series in speech communication. Albany, NY: State University of New York Press.
- Del Favero, M. (2003). Faculty-Administrator relationships as integral to high-performing governance systems: New frameworks for study. *American Behavioral Scientist, 46*(7), 902-922.
- Denzin, N. K. (1989). *Interpretive biography*. Newbury Park, CA: Sage.
- Denzin, N.K., & Lincoln, Y.S. (1994). *Handbook of qualitative research*. London: Sage Publications, Inc.
- Dettmar, K. J. H. (2004). What we waste when faculty hiring goes wrong. *The Chronicle of Higher Education*, December 17, B6-B8.
- DeVol, R., Koepp, R., Wallace, L., Bedroussin, A., & Murphy, D. (2005). *The greater Philadelphia life sciences cluster: An economic and comparative assessment*. Santa Monica, CA: Milken Institute.
- Diamond, R. (1999). *Aligning faculty rewards with institutional mission: Statements, policies, and guidelines*. Bolton, MA: Anker Publishing.
- Diamond, R. M., & Adam, B. E. (1997). *Changing priorities at research universities: 1991-1996*. Syracuse, NY: Center for Instructional Development, Syracuse University.

- Dill, D. D. (1984). The nature of administrative behavior in higher education. *Educational Administration Quarterly*, 20(3), 69-99.
- Dill, D. & Sporn, B (Eds.) (1995). *Emerging patterns of social demand and university reform: Through a glass darkly*. New York: Pergamon.
- Dotlich, D. L., & Cairo, P. C. (2002). *Unnatural leadership: Going against intuition and experience to develop ten new leadership instincts*. San Francisco: Jossey-Bass.
- Drath, W. H. (2001). *The deep blue sea: Rethinking the source of leadership*. San Francisco: Jossey-Bass.
- Duderstadt, J. J. (2000). *A university for the 21st century*. Ann Arbor: University of Michigan Press.
- Duffee, L., & Aikenhead, G. (1992). Curriculum change, student evaluation, and teacher practical knowledge. *Science Education*, 76(5), 493-506.
- Dunkin, R. (2003). Motivating knowledge workers: Lessons to and from the corporate sector. *Higher Education Management and Policy*, 15(3), 41-49.
- Dyer, B. G. & Miller, M. (1999). A critical review of literature related to the department chair position.
- Eddy, J. P., Spaulding, D. J., Richards, T. Morris, A. J., Murphy, S. D., Malmberg, E. D., & Brubaker, T. (1998). Retaining quality students and faculty: The need for refined higher education leadership policies and procedures. *College Student Journal*, 32(2), 222-227.
- Edwards, R. (1999, September/October). How does it fit into the university reform agenda? *Change*, 31(5), 16-27.
- Eisner, E. W. (1991). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York, NY: Macmillan Publishing Company.
- Elliott, J. (1990) Validating case studies, *Westminster Studies in Education*, 13, 47-60.
- Erickson, B. H. (1988). The relational basis of attitudes. In B. Wellman & S. D. Berkowitz, (Eds.), *Social structures: A network approach* (pp. 99-121). Cambridge, England: Cambridge University Press.
- Etzkowitz, H., Webster, A., & Healey, P. (1998). *Capitalizing knowledge: New intersections of industry and academia*. Albany, NY: State University of New York.

- Fain, P. (2005). Competitive pressure is turning research universities into look-alike institutions, economist warns. *The Chronicle of Higher Education*. Retrieved on July 11, 2005 from <http://chronicle.com/dialy/2005/07/2005071103n.htm>.
- Fairweather, J. (1988). Entrepreneurship and higher education: Lessons for colleges, universities, and industry. *ASHE-ERIC Higher Education Report, No. 6*. Washington, D.C.: Association for the Study of Higher Education.
- Fairweather, J. (1996). *Faculty work and public trust: Restoring the value of teaching and public service in American life*. Boston: Allyn and Bacon.
- Fairweather, J. S. & Beach, A. L. (2002). Variations in faculty work at research universities: implications for state and institutional policy. *The Review of Higher Education, 26*(1), 97-115.
- Fairweather, J. A., & Rhoads, R. A. (1995). Teaching and the faculty role: Enhancing the commitment to instruction in American colleges and universities. *Educational Evaluation and Policy Analysis, 17*, 179–94.
- Feeney, J., Mumpower, J. L., & Santiago, C. E. (2004). Research universities and public/private partnerships in the knowledge-based economy. *Journal of Higher Education Strategists, 1*(4), 367-386.
- Feldman, K. A. (1987). Research productivity and scholarly accomplishment of college teachers as related to their instructional effectiveness: A review and exploration. *Research in Higher Education, 26*, 227–298.
- Fink, L. D. (Ed.). (1984). *The first year of college teaching*. New Directions for Teaching and Learning, No. 17. San Francisco, CA: Jossey-Bass.
- Finkelstein, M. (1997). From tutor to specialized scholar: Academic professionalization in eighteenth and nineteenth century America. In L. F. Goodchild & H. S. Wechsler (Eds.) *The History of Higher Education Second Edition*. Boston, MA: Pearson Custom Publishing.
- Finkelstein, M., Seal, R., & Schuster, J. (1998). *The new academic generation: A profession in transition*. Baltimore, MD: Johns Hopkins University Press.
- Fischer, K. (2005, March 11). Meeting employers' needs: States try financial incentives to get colleges to train workers in high demand professions. *The Chronicle of Higher Education*. Retrieved April 12, 2005 from <http://chronicle.com/prm/weekly/v51/i27/27a02101.htm>.

- Fodor, E. M. (1974). Disparagement by a subordinate as an influence on the use of power. *Journal of Applied Psychology*, 59, 764-766.
- Fonow, M. M., & Cook, J. A. (Eds.). (1991). *Beyond methodology: Feminist scholarship as lived research*. Bloomington: Indiana University Press.
- Fox, M. F. (1991). Gender, environmental milieu, and productivity in science. In H. Zuckerman, J. R. Cole, & J. T. Bruer (Eds.), *The outer circle: Women in the scientific community* (pp. 107-119). New Haven, CT: Yale University Press.
- Fox, M. F. (1995). Women in scientific careers. In S. Jasanoff et al. (Eds.), *Handbook of science and technology studies*. Thousand Oaks, CA: Sage.
- Fullan, Michael (2001). *Leading in a culture of change*. San Francisco: Jossey-Bass.
- Gaff, J. G., & Lambert, L. M. (1996). Socializing future faculty to the values of undergraduate education. *Change*, 28(4), 38-45.
- Gaff, J. G., & Weibl, R. A. (1998, Spring). What is the faculty interest in leading academic change? *Learning Productivity News*, 3(2), 3-4.
- Gardner, H. (2004). *Changing minds: The arts and science of changing our own and other people's minds*. Cambridge, MA: Harvard Business School Publishing.
- Gardner, J. W. (1993). *On leadership*. New York: The Free Press.
- Gartrell, C. D. (1987). Network approaches to social evaluation. *Annual Review of Sociology*, 13, 49-66.
- Gerstenberger, D. (1981). As the twig is bent: Faculty development. *ADE Bulletin*, 67, 19-21.
- Glaser, B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. Mill Valley, CA: Sociological Press.
- Glaser, B. G., & Strauss, A. L. (1999). *The discovery of grounded theory: Strategies for qualitative research*. Hawthorne, NY: Aldine De Gruyter.
- Glassick, C. E., Huber M.T., and Maeroff, G. I. (1997). *Scholarship assessed: Evaluation of the professorate*. San Francisco: Jossey-Bass.
- Glesne, C., & Peshkin, A. (1992). *Becoming qualitative researchers: An introduction*. New York: Longman.

- Gluck, S. B., & Patai, D. (Eds.).(1991). *Women's words: The feminist practice of oral history*. New York: Routledge.
- Gmelch, W. H. (1993). *Coping with faculty stress*. Newbury Park, CA: Sage Publications.
- Gmelch, W. H., & Burns, J. S. (1993). The cost of academic leadership: Department chair stress. *Innovative Higher Education*, 17(4), 259-270.
- Gmelch, W. H., Burns, J. B., Carroll, J. B., Harris, S., & Wentz, D. (1992). *Center for the Study of the Department Chair: 1990 Survey*. Pullman, WA: Washington State University.
- Gmelch, W. H., Damico, S. B., Hopkins, D., Mitchell, J. N. (2006, April). *Passages in the profession: Personal, institutional, and professional policy implications for the development of academic deans*. Symposium conducted at the American Educational Research Association Annual Meeting, San Francisco, California.
- Gmelch, W. H., Lovrich, N. P., & Wilkie, P. K. (1986). Dimensions of stress among university faculty: Factor analysis results form a national study. *Research in Higher Education*, 24, 266-286.
- Gmelch, W. H., & Miskin, V. D. (1995). *Chairing an academic department*. Newbury Park, CA: Sage Publications.
- Goleman, D., Boyatzis, R., & McKee, A. (2002). *Primal leadership: Realizing the power of emotional intelligence*. Boston: Harvard Business School Press.
- Good practice in tenure evaluation: Advice for tenured faculty, department chairs, and academic administrators*. (2000) American Council on Education, American Association of University Professors, and United Educators Insurance Risk Retention Group.
- Granovetter, M.,(1973). The strength of weak ties. *The American Journal of Sociology*,78(6), 1360-1380.
- Greenleaf, R. K. (1996). *On becoming a servant-leader*. San Francisco: Jossey-Bass.
- Guterman, L. 2005). Higher education 2015: Research Inc. *The Chronicle of Higher Education*. November 25. Retrieved on November 21, 2005 from <http://chronicle.com/weekly/v52/i14/14a01301.htm>.
- Hammond, T. H. (2004). *Herding cats in university hierarchies: The impact of formal structure on decision-making in American research universities*. Paper presented at the conference on Governance in Higher Education at Cornell University, Ithaca, NY, June 4-5.

- Harry, J., & Goldner, N. S. (1972). The null relationship between teaching and research. *Sociology of Education, 45*, 47-60.
- Hattie, J., & Marsh, H. W. (1996). The relationship between research and teaching—a meta-analysis. *Review of Educational Research, 66*, 507-542.
- Hearn, J. C. (1999). Faculty salary structures in research universities: Implications for productivity. In W. Tierney (Ed.), *Faculty productivity: Facts, fictions, and issues* (pp. 123–173). New York: Falmer.
- Hecht, I. W. D., Higgerson, M. L., Gmelch, W. H., & Tucker, A. (1999). *The department chair as academic leader*. Phoenix, AZ: The Oryx Press.
- Heifetz, R. A., & Linsky, M. (2002). *Leadership on the line: Staying alive through the dangers of leading*. Boston: Harvard Business School Press.
- Heimler, C. H., (1972). The college departmental chairman. In J. Brann & T. A. Emmet (Eds.) *The Academic Department or Division Chairman: A Complex Role*. Detroit: Balamp.
- Henkel, M. (2000). *Academic identities and policy change in higher education*. London: Jessica Kingsley Publishers.
- Herzberg, F., Mausner, B., Snyderman, B., and Bloch, W. (1959). *The motivation to work, Second edition*. New York: Wiley.
- Higgerson, M. L. (1996). *Communication skills for department chairs*. Bolton, MA: Anker Publishing Company.
- Hill, W. W., & French, W. L. (1967). Perceptions of power of department chairmen by professors. *Administrative Science Quarterly, 11*(4), 548-574.
- Hines, E. R., & Higham, J. R. (1996, November). *Faculty workload and state policy*. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Memphis, TN.
- Hoepfl, M. C. (1997). Choosing qualitative research: A primer for technology education researchers. *Journal of Technology Education, 9*(1), 47-63.
- Hollander, E. P. (1997). *How and why active followers matter in leadership*. College Park, MD: Academy of Leadership Press.
- Hollander, E. P. (1992). The essential interdependence of leadership and followership. *Current Directions in Psychological Science, 1*(2), 71-75.

- Hollander, E. P., & Julian, J. W. (1969). Contemporary trends in the analysis of leadership processes. *Psychological Bulletin*, 71, 387-397.
- Hollander, E. P., & Offerman, L. (1990). Power and leadership in organizations: Relationships in transition. *American Psychologist*, 45, 179-189.
- Howard, C. L., & Green, D. M. (1999). All in a chair's work: How to survive the leap into department administration. *ASEE Prism*, 8(5), January 12.
- Huber, R. M. (1992). *How professors play the cat guarding the cream: Why we're paying more and getting less in higher education*. Fairfax, VA: George Mason University Press.
- Huber, S. (2000). Tenure of the corporate assembly line. In G. D. White & F. C. Hauck (Eds.) *Campus, Inc.: Corporate Power in the Ivory Tower*. Amherst, NY: Prometheus Books.
- Jarvis, P. (1992). *Paradoxes of learning: On becoming an individual in society*. San Francisco: Jossey-Bass.
- Johnson, M. J., Hanna, D. E., & Olcott, D. (2003). *Bridging the gap: Leadership, technology, and organizational change for university deans and chairpersons*. Madison, WI: Atwood Publications.
- Keith, B., & Moore, H. (1995). Training sociologists: An assessment of professional socialization and the emergence of career aspirations. *Teaching Sociology* 23(3), 199-214.
- Keller, G. (1983). *Academic strategy: The management revolution in American higher education*. Baltimore, MD: Johns Hopkins University Press.
- Kimble, G. A. (1978). *How to use (and misuse) statistics*. Englewood Cliffs, NJ: Prentice-Hall.
- Kirk, J., & Miller, M. L. (1986). *Reliability and validity in qualitative research*. Beverly Hills: Sage Publications.
- Klein, T. (1985). What one academic department in a university learned from general education reform. *Liberal Education*, 71(4), 327-334.
- Knight, P. T., and Trowler, P. R. (2001). *Departmental leadership in higher education*. Suffolk, Great Britain: Open University Press.
- Kozma, R. B. (1985). A grounded theory of instructional innovation in higher education. *Journal of Higher Education*, 56(3), 300-319.

- Krieger, S. (1991). *Social science and the self: Personal essays on an art form*. New Brunswick, NJ: Rutgers University Press.
- Kreuger, R.A. (1988). *Focus groups: A practical guide for applied research*. London: Sage Publications, Inc.
- Langfitt, T. W., & Ambrose, M. J. (1985). A blueprint for corporate-academic research cooperation. *Advanced Management Journal*, 50, 13-17.
- Lasher, W. F., & Greene, D. L. (1993). College and university budgeting: What do we know? What do we need to know? In J. Smart, (Ed.), *Higher Education: Handbook of Theory and Research* (Vol. 9, pp. 428-469). New York: Agathon Press.
- Lather, P. (1993) Fertile obsession: validity after poststructuralism, *Sociological Quarterly*, 34, 673-693.
- Leaming, D. (1998). *Academic leadership: A practical guide to chairing the department*. Bolton, MA: Anker Publishing Company.
- Leslie, D.W. (1973, December). The status of the department chairmanship in university organization. *AAUP Bulletin*, 59(4), 419-426.
- Leveille, D. E. (2005). *An emerging view on accountability in American higher education*. Research and Occasional Paper Series, 8.05. Center for Studies in Higher Education, Berkeley: University of California
- Leydesdorff, L., & Etzkowitz, H. (2001). The transformation of university-industry-government relations. *Electronic Journal of Sociology*, 5(4).
- Lindholm, J.A. (2003). Perceived organizational fit: Nurturing the minds, hearts, and personal ambitions of university faculty. *The Review of Higher Education*, 27(1), 125-149.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills: Sage Publications, Inc.
- Long, J. S. (1990). The origins of sex differences in science. *Social Forces* 68(4), 1297-1315.
- Long, J. S., & McGinnis, R. (1981). Organizational context and scientific productivity. *American Sociological Review*, 46, 422-442.
- Lovett, C. M. (2005). The perils of pursuing prestige. *The Chronicle of Higher Education*, January 21. Retrieved on April 8, 2005 from <http://chronicle.com/prm/weekly/v51/i20/20b02001.htm>.

- Lucas, A. F. (2000). *Leading academic change: Essential roles for department chairs*. San Francisco: Jossey-Bass.
- Lueddeke, G. R. (1999). Toward a constructivist framework for guiding change and innovation in higher education. *Journal of Higher Education*, 70(3), 235-260.
- Lyall, K. C. & Sell, K. R. (2005). *The True Genius of America at Risk : Are We Losing Our Public Universities to De Facto Privatization?* Westport, CT: Praeger Publishers.
- Maehr, M. L., & Braskamp, L. A. (1986). *The motivation factor: A theory of personal investment*. Lexington, MA: Lexington.
- Mahoney, J. (1972). Chairman as messmaker. In J. Brann & T. A. Emmet (Eds.) *The Academic Department or Division Chairman: A Complex Role*. Detroit: Balamp.
- Mansfield, E., & Lee, J. (1996). The modern university: Contributor to industrial innovation and recipient of industrial R&D support. *Research Policy*, 25, 1047-1058.
- Marcus, L. R. (1997). Restructuring higher education governance patterns. *Review of Higher Education*, 20(4), 399-418.
- Marsden, P. V., & Friedkin, N. H. (1994). Network studies of social influence. In S. Wasserman & J. Galaskiewicz (Eds.), *Advances in social network analysis: Research in the social and behavioral sciences* (pp. 3 –25). Thousand Oaks, CA: Sage.
- Marsh, H. W. (1987). Students' evaluations of university teaching: Research findings, methodological issues, and directions for further research. *International Journal of Educational Research*, 11, 253-388.
- Marsh, H. W. & Hattie, J. (2002). The relation between research productivity and teaching effectiveness: Complimentary, antagonistic, or independent constructs? *The Journal of Higher Education*, 73(5), 603-641.
- Marshall, G. (2005). Mind the gap! Policy issues for e-learning proponents. *Educational Media International*, 42(2), 153-159.
- Massy, W. F., & Wilger, A. K. (1995). Improving productivity: What faculty think about it--and its effect on quality. *Change*, 27(4), 10-20.
- Matusak, L.R. (1997). *Finding your voice: Learning to lead...anywhere you want to make a difference*. San Francisco: Jossey-Bass.

- Maxwell, J. (1992) Understanding and validity in qualitative research, *Harvard Educational Review*, 62, 279-300.
- Maxwell, K. (1998). Review of book by Charles E. Glassick, Mary T. Huber, and Gene I Maeroff (1997). *Scholarship assessed: Evaluation of the professorate*. San Francisco: Jossey-Bass.
- Mazzoleni, R. (2004). *The development of universities and public research institutions: a historical overview of its role in technological and economic catch up*. Retrieved on August 6, 2005 from [http://www.fscpo.unict.it/pdf/Mazzoleni%20%20\(paper\).pdf](http://www.fscpo.unict.it/pdf/Mazzoleni%20%20(paper).pdf).
- McAdams, R. P. (1997). Revitalizing the department chair: Ten recommendations to make the role more attractive, powerful, and effective. *AAHE Bulletin*, 49(6), 10-13.
- McDade, S. A. (1987). *Higher education leadership: Enhancing skills through professional development programs*. ASHE-ERIC Report No.5.
- McMillan, G. S., Narin, F., Deeds, D. L. (1999). An analysis of the critical role of public science in innovation: the case of biotechnology. *Research Policy* 29, 1-8.
- McKay, R. (2004). Flying the colors: Coping successfully with site visits from accrediting agencies. *Portal: Libraries and the Academy*, 4(1), 145-148.
- McLaughlin, G. W., Montgomery, J. R., & Malpass, L. F. (1975). Selected characteristics, roles, goals, and satisfactions of department chairmen in state and land grant institutions. *Research in Higher Education*, 3, 243-259.
- McNay, I. (1995). From the collegial academy to corporate enterprise: The changing cultures of universities in T. Schuller (Ed.), *The Changing University?* London: Open University Press.
- Mehra, B. (2001). Research or personal quest: Dilemmas in studying my own kind. In B. M. Merchant & A. I. Willis (Eds.), *Multiple and intersecting identities in qualitative research*. Mahwah, NH: Lawrence Erlbaum.
- Merton, R.K., Fiske, M., & Kendall, P.L. (1990). *The focused interview: A manual of problems and procedures*. (2nd ed.). London: Collier MacMillan.
- Mets, L. A. (1995, Summer). Program review in academic departments. In R.J. Barak and L.A. Mets (Eds.), *Using Academic Review* (pp. 19-36). New Directions for Institutional Review, no. 86. San Francisco: Jossey-Bass.
- Middaugh, M. F. (2004). A benchmarking approach to managing instructional costs and enhancing faculty productivity. *Journal for Higher Education Strategists*, 1(3), 221-241.

- Middaugh, M. F. (2002). Faculty productivity: Different strategies for different audiences. *Planning for Higher Education*, 30 (3), 34-43, Spring.
- Middaugh, M. F. (2001). *Understanding faculty productivity: Standards and benchmarks for colleges and universities*. San Francisco: Jossey-Bass.
- Middaugh, M. F. & Isaacs, H. K. (2003, February). *A consortial approach to assessing departmental productivity and efficiency: The Delaware study*. Paper presented at the meeting of the Southwest Educational Research Association, San Antonio, TX.
- Miles, M. & Huberman, M. (1984) *Qualitative Data Analysis*. London: Sage.
- Milken, M. (2003). American science, American lives. *The Wall Street Journal*. Retrieved on July 19, 2005 from www.milkeninstitute.org/publications.
- Mitchell, M. B. (1987). The process of department leadership. *Review of Higher Education*, 11(2), 161-176.
- Morello, D. (2000). The disruptive impact of knowledge work: Retention. Gartner, www.gartner.com/public/static/hotc.
- Morgan, B. L. & Cerbin, W. (2001). You've got mentoring: Enhancing new faculty development with timely email bulletins. *AAHE Bulletin*, November.
- Morgan, G., Frost, P. J., & Pondy, L. R. (1983). Organizational symbolism. In L. R. Pondy, P. J. Frost, G. Morgan, & T. C. Dandridge (Eds.), *Organizational symbolism* (pp. 3-35). Greenwich, CT: JAI.
- Mortenson, T. G. (1994). Whose responsibility is it? Shifting responsibilities for financing higher education from government to individuals. *Postsecondary Education Opportunity*, 19, 7-16.
- Moses, I. And Roe, E. (1990). *Heads and chairs: Managing academic departments*. St. Lucia, Queensland, Australia: University of Queensland Press.
- Mulder, M. (1971). Power equalization through participation? *Administrative Science Quarterly*, 16, 31-38.
- Murray, M. (2001). *Beyond the myths and magic of mentoring: How to facilitate an effective mentoring process*. San Francisco: Jossey-Bass.
- Nano Investor News (2004). *Research and markets: Nanobiotechnology: Opportunities and technical analysis*. <http://www.nanoinvestornews.com/modules.php?name=News&file=article&sid=3389>.

- National Nanotechnology Initiative - Strategic Plan* (2004). Co-produced by the U.S. National Science and Technology Council and the U.S. Office of Science and Technology Policy. http://nano.gov/NNI_Strategic_Plan_2004.pdf.
- National Science Board. (1998). *Science & engineering indicators 1998*. Washington, DC: National Science Foundation.
- Narin, F., Hamilton, K., Olivastro, D., 1997. The increasing linkage between US technology and public science. *Research Policy* 26, 317–330.
- Nelkin, D. & Nelson, R. (1986). University-industry alliances: New trends for an old idea. *News Report* (National Research Council), 36, 19-24.
- Neumann, A. (1993). *The ties that bind: Notes on professional collegueship as academic context*. American Educational Research Association. April, Atlanta, GA.
- Neumann, A., and Larson, R. S. (1997). *Enhancing the leadership factor in planning and management for a changing environment* (pp. 191-203). San Francisco: Jossey-Bass.
- Neumann, B. (1992) Perceptions of the teaching-research nexus: A framework for analysis, *Higher Education*, 23, 159-171.
- Neustadt, R. (1990). *Presidential power and modern presidents. Revised edition*. New York: Free Press.
- New England Association of School and Colleges (2005). Retrieved on May 27, 2005 from <http://www.neasc.org/neasc/aboutneasc.htm>.
- Newfield, C. (2003). *Ivy and industry: Business and the making of the American university, 1880-1980*. Durham, NC: Duke University Press.
- Newman, F. & Couturier, L. (2002). ...And a new compact with their states. *The Chronicle of Higher Education*, October 18, Volume 49, Issue 8, Page B13.
- Newman, F., Couturier, L., & Scurry, J. (2004). Higher education isn't meeting the public's needs. *The Chronicle of Higher Education*, October 15. Retrieved on April 8, 2005 from <http://chronicle.com/prm/weekly/v51/i08/08b00601.htm>.
- Newman, F., Couturier, L., & Scurry, J. (2004). *The future of higher education: Rhetoric, reality, and the risks of the market*. San Francisco: Jossey-Bass.
- Niemeier, D. A., & Gonzalez, C. (2004). Breaking into the guildmasters club: What we know about women science and engineering department chairs at AAU universities. *NWSA Journal* 16(1), 157-171.

- Norris, N. (1997). Error, bias and validity in qualitative research. *Educational Action Research*, 5(1), 172-176.
- Northouse, P. G. (2003). *Leadership: Theory and practice*. Newbury Park, CA: Sage Publications.
- Norton, S. (1980). *Academic department chair: Tasks and responsibilities*. Tempe, AZ: Arizona State University.
- Nowotny, H., Scott, P., and Gibbons, M. (2001). *Rethinking science: Knowledge and the public in an age of uncertainty*. Cambridge: Polity.
- Oblinger, D. G., & Verville, A. (1998). *What business wants from higher education*. Phoenix, AZ: Oryx Press.
- O'Connor, A. (2000). Review of book by Jeff Schmidt, *Disciplined minds: A critical look at salaried professionals and the soul-battering system that shapes their lives*. Lanham, Maryland: Rowman & Littlefield.
- O'Meara, K. A. (2002). Uncovering the values in faculty evaluation of service as scholarship. *The Review of Higher Education*, 26(1), 57-80.
- Olsen, D., & Crawford, L. A. (1998). A five-year study of junior faculty expectations about their work. *The Review of Higher Education*, 22(1), 39-54.
- Olsen, D., Maple, S. A., & Stage, F. K. (1995). Women and minority job satisfaction: Professional role interests, professional satisfactions, and institutional fit. *Journal of Higher Education*, 66, 267-293.
- Olson, C. (2005). A broad based approach to internationalization. *Global Learning*, 21(5), 7-9.
- O'Reilly, C. A., Chatman, J., & Caldwell, D. F. (1991). People and organizational culture: A profile comparison approach to assessing person-organization fit. *Academy of Management Journal*, 34, 487-516.
- Pascarella, E.T., and Terenzini, P.T. (1991). *How college affects students: Findings and insights from twenty years of research*. San Francisco: Jossey-Bass (ED 330 287).
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage Publications, Inc.
- Perkin, H. (1997). History of universities. In L. F. Goodchild & H. S. Wechsler (Eds.) *The History of Higher Education Second Edition*. Boston, MA: Pearson Custom Publishing.

- Perlman, B. & McCann, L. I. (2003). Improving the odds of hiring the right person. In D. R. Leaming (Editor), *Managing people: A guide for department chairs and deans*. Bolton, MA; Anker Publishing Company, Inc.
- Peters, D. S., & Mayfield, R. J. (1982). Are there any rewards for teaching? *Improving College and University Teaching*, 30, 105–110.
- Pfeffer, J. (1977). The ambiguity of leadership. *Academy of Management Review*, 2, 104-112.
- Pfeffer, J. & Salancik, G. (1974). Organizational decision making as a political process. *Administrative Science Quarterly*, 19(2), 151-165.
- Phelan, P. & Reynolds P. (1996) *Evidence and Argument: critical analysis for the social sciences*. London: Routledge.
- Plater, W. M. (2000). Foreword. In E. M. Bensimon, K. Ward, & K. Sanders, *The department chair's role in developing new faculty into teachers and scholars*. Bolton, MA: Anker Publishing Company, Inc.
- Poole, M. S., & McPhee., R. D. (1983). A structural analysis of organizational culture. In L. L. Putnam & M. E. Pacanowsky (Eds.), *Communication and organizations: An interpretive approach* (pp. 195–220). Beverly Hills: Sage.
- Post, J. M. (1986). Narcissism and the charismatic leader-follower relationship. *Political Psychology*, 7, 675-688.
- Powers, J. B. (2003). Commercializing academic research: Resource effects on performance of university technology transfer. *The Journal of Higher Education*, 74(1), 26-49.
- Presley, J. B., & Engelbride, E. (1998). Accounting for faculty productivity in the research university. *The Review of Higher Education*, 22(1), 17-37.
- Ramsden, P. (2000). *Learning to lead in higher education*. New York: Routledge.
- Reich, R. B. (1987). Entrepreneurship reconsidered: the team as hero. *Harvard Business Review*, 65 (3), 77-83.
- Reinharz, S. (1992). *Feminist methods in social research*. New York: Oxford University Press.
- Reskin, B. (1979). Academic sponsorship and scientists' careers. *Sociology of Education* 52(3),129-146.
- Rhoades, G. (1998). *Managed professionals: Unionized faculty and restructuring academic labor*. Albany: State University of New York Press.

- Rice, R. E., and Austin A. E. (1998). High faculty morale: What exemplary colleges do right. *Change*, 20(2), 50-58.
- Rice, R. E., Sorcinelli, M. D., & Austin, A. E. (2000). *Heeding new voices: Academic careers for a new generation*. New Pathways Inquiry No. 7. Washington, DC: American Association for Higher Education.
- Riessman, C. K. (1993). *Narrative analysis*. Newbury Park, CA: Sage Publications.
- Roach, J. H. L. (1976). The academic department chairperson: Roles and responsibilities. *Educational Record*, 57(1), 13-23.
- Robertson, J., & Bond, C. H. (2001). Experiences of the relation between teaching and research: What do academics value? *Higher Education Research and Development*, 20(1), 5-19.
- Rosser, V. J. (2005). Measuring the change in faculty perceptions over time: An examination of their worklife and satisfaction. *Research in Higher Education*, 46(1), 81-107.
- Rothwell, W. J. (2005). *Effective succession planning: Ensuring leadership continuity and building talent from within*. New York, NY: AMACOM.
- Russell, J. E. A., & Adams, D. M., (1997). The changing nature of mentoring in organizations: An introduction to the special issue of mentoring in organizations. *Journal of Vocational Behavior* 51(1), 1-14.
- Sample, S. B. (1972). Inherent conflict between research and education. *Educational Record*, 53, 17-22.
- Savage, J. D. (1999). *Funding science in America: Congress, universities, and the politics of American pork*. Cambridge, U.K.: Cambridge University Press.
- Scheurich, J. J. (1994). Social relativism: A postmodernist epistemology for educational administration. In S. J. Maxcy (Ed.), *Postmodern school leadership: Meeting the crisis in educational administration*. Westport, CT: Praeger.
- Schon, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Seagren, A. T., Creswell, J. W., and Wheeler, D. W. (1993). *The department chair: New roles, responsibilities, and challenges*. ASHE-ERIC Higher Education Report No. 1. Washington, D.C.: The George Washington University.
- Seagren, A. T., and Filan, G. (1992). *The International Community College Chair Survey*. Mesa, AZ and Lincoln, NB: National Community College Chair Academy, Maricopa

Community College, and Center for the Study of Higher and Postsecondary Education, University of Nebraska-Lincoln.

- Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday Currency.
- Serow, R. C., Van Dyk, P. B., McComb, E. M., and Harrold, A. T. (2002). Cultures of undergraduate teaching at research universities. *Innovative Higher Education*, 27(1), 25-37.
- Shaw, K. A. (1999). *The successful president: "BuzzWords" on leadership*. Phoenix, AZ: Oryx Press.
- Singer, J. E. (1980). Social comparison: The process of self-evaluation. In L. Festinger (Ed.), *Retrospections on social psychology* (pp. 158–179). Oxford, England: Oxford University Press.
- Slaughter, S., & Leslie, L. L. (1997). *Academic capitalism - Politics, policies, and the entrepreneurial university*. Baltimore: The Johns-Hopkins University Press.
- Slaughter, S., & Leslie, L. L. (2000). Professors going pro: The commercialization of teaching, research, and service. In G. D. White & F. C. Hauck (Eds.) *Campus, Inc.: Corporate Power in the Ivory Tower*. Amherst, NY: Prometheus Books.
- Smart, J. C., & Elton, C. F. (1976). Administrative roles of department chairmen. *New Directions for Institutional Research*, 10, 39-59.
- Smith, E. P., & Davidson, W. S., II. (1992). Mentoring and the development of African-American graduate students. *Journal of College Student Development* 33(6), 531-539.
- Smith, P. (1990). *Killing the spirit: Higher education in America*. New York: Viking.
- Smyth, J. (Ed.) (1995). *Academic work: The changing labour process in higher education*. Buckingham, London: Open University Press.
- Sonnert, G., & Holton, G. (1995). *Gender differences in science careers: The project access study*. New Brunswick, NJ: Rutgers University Press.
- Sorcinelli, M. D. (1992). New and junior faculty stress: Research and responses. In M. D. Sorcinelli & A. E. Austin (Eds.). *Developing new and junior faculty*. New Directions for Teaching and Learning (Vol. 50, pp. 27-37). San Francisco: Jossey-Bass.

- Sours, J. S. (1997). *A descriptive analysis of technical education learning styles*. University of Arkansas: Unpublished doctoral dissertation.
- Spradley, J. P. (1980). *Participant observation*. New York: Holt, Rinehart & Winston. SRI International, Public Policy Center. *The higher education-economic development connection: Emerging roles for public colleges and universities in a changing economy*. Washington, D.C.: American Association of State Colleges and Universities.
- Stake, R. E. (1978). The case study method in social inquiry. *Educational Researcher*, 7(2), 5-8.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications, Inc.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Newbury Park, CA: Sage Publications, Inc.
- Stewart, D.W., & Shamdasani, P.N. (1990). *Focus groups: Theory and practice*. London: Sage Publications, Inc.
- Sullivan, A. V. S. (1996). Teaching norms and publication productivity. *New Directions for Institutional Research*, 90, 15-21.
- Symonds, W. C. (2005). A talk with Apollo Group's CEO. *Business Week*, January, 31. *The Chronicle of Higher Education* (2005, April). Federal obligations for academic research rose 10.3% in 2003, NSF reports. Retrieved on April 14, 2005 from <http://chronicle.com/daily/2005/04/2005041403n.htm>.
- Tien, F., & Blackburn, R. T. (1993). *Faculty rank systems, research motivation, and research productivity*. Paper presented at the annual meeting of the American Educational Research Association: Atlanta, GA.
- Tierney, W. G., & Bensimon, E. M. (1996) *Promotion and tenure: Community and socialization in academe*. Albany: State University of New York Press.
- Toma, J. D. (2003). *Football U: Spectator sports in the life of the American university*. Ann Arbor: University of Michigan Press.
- Tornatzky, L. G., Waugaman, P. G., Gray, D. O. (2002). *Innovation U. New university roles in a knowledge economy*. Research Triangle Park: Southern Growth Policies Board.
- Torr, M. R. (2002). *Testimony on federal funding and the research university*. Before the Senate Subcommittee on Science, Technology and Space of the U.S. Senate Committee on Commerce, Science and Transportation, May 22. Retrieved on April 18, 2005 at

<http://commerce.senate.gov/hearings/052202torr.pdf#search='research%20funding%20impact%20on%20>

- Treadwell, D. F. (1997). The department chair: A symbolic perspective and some implications. *Journal of the Association for Communication Administration*, 3, 218-224.
- Trice, H. M., & Beyer, J. M. (1993). *The cultures of work organizations*. Englewood Cliffs, NJ: Prentice Hall.
- Tucker, A. (1984). *Chairing the academic department: Leadership among peers*. 2nd edition. New York: ACE/MacMillan.
- Tucker, A. (1992). *Chairing the academic department: Leadership among peers*. 3rd edition. New York: ACE/MacMillan.
- Tucker, A., & Bryan, R. A. (1988). *The academic dean: Dove, dragon and diplomat*. New York: Macmillan.
- Verquer, M. L., Beehr, T. A., & Wagner, S. H. (2002). A meta-analysis of relations between person-organization fit and work attitudes. *Journal of Vocational Behavior*, 63, 473-489.
- Volkwein, J. F., and Carbone, D. A. (1994). The impact of departmental research and teaching climates on undergraduate growth and satisfaction. *Journal of Higher Education*, 65(2), 147-167.
- Waltzer, H. (1975). *The job of academic department chairman*. Washington, D.C.: American Council on Education.
- Walwood, B. E., Carey, A. K., Smith, H. L., Soled, S. W., Way, P. K., and Zorn, D. (2000). *Academic departments: How they work, how they change*. San Francisco: Jossey-Bass.
- Wankat, P. C. (2002). *The effective, efficient professor: Teaching, scholarship and service*. Boston: Allyn and Bacon.
- Weinberg, S. S. (1984). The perceived responsibilities of the departmental chairperson: A note of a preliminary study. *Higher Education*, 13(3), 299-307.
- Whalen, E. L. (1991). *Responsibility center budgeting: An approach to decentralized management for institutions of higher education*. Bloomington: Indiana University Press.
- Wheatley, M. J. (1999). *Leadership and the new science: Discovering order in a chaotic world*. San Francisco: Berrett-Koehler Publishers.
- Wheeler, D. W. (1992). The role of the chairperson in support of junior faculty. *New Directions for Teaching and Learning*, 50, 87-96.

- Whitson, L. J., and Hubert, F. W. R. (1982). Interest groups and the department chairperson: The exertion of influence in the large public university. *Journal of Higher Education*, 53(2), 163-176.
- Whitt, E. J. (1991). Hit the ground running: Experiences of new faculty in a school of education. *Review of Higher Education*, 14(2), 177-197.
- Willcoxson, L., and Walker, P. (1995). Valuing Teaching: A strategy for changing the organizational culture of an academic department. *Higher Education Research and Development*, 14(2), 269-278.
- Wilson, R. (2002, October 18). Bickering decimates a department. *The Chronicle of Higher Education*, 49(8), A12.
- Wolverton, M., Gmelch, W. H., Montez, J., and Nies, C. T. (2001). *The Changing Nature of the Academic Deanship*. San Francisco: Jossey-Bass.
- Wolverton, M., Gmelch, W. H., Wolverton, M. and Sarros, J. C. (1999). Stress in academic leadership: U.S. and Australian department chairs/heads. *The Review of Higher Education*, 22(2), 165-185.
- Wright, W. A. (1994). Heads hold key to faculty development. *Department Chair*, Summer, 2-3.
- Zemsky, R. (1995). *The department as a fulcrum for change*. Presentation at the American Association for Higher Education Conference on Assessment and Quality, Boston, MA.
- Zemsky, R. (1996). Double agent. *Policy Perspectives*. Pew Higher Education Roundtable. (ED 394 366).
- Zemsky, R., and Massy, W. (1990). Cost containment: Committing to a new economic reality. *Change*, 22(6), 16-22.
- Zucker, L.G., Darby, M. R., 1996. Costly information: firm transformation, exit, or persistent failure. *American Behavioral Scientist* 39, 959–974.
- Zucker, L.G., Darby, M. R., 1997. Present at the biotechnological revolution: transformation of technological identity for a large incumbent pharmaceutical firm. *Research Policy* 26, 429–446.

Appendix A

Interview Protocol: Biological Sciences Department Chairs

1. Tell me how you came to be a department chair of a biological science department? What is your background and training?
2. What does the word mentoring mean to you? Does your department have a formal mentoring program?
3. What do you look for in new faculty hires? Does an assistant professor candidate need to have federal funding before applying here? Do they need to have published?
4. Can you tell if a new hire is going to be successful? How quickly? What are the signs?
5. What sort of investments do you make in new hires?
6. What sort of orientation do you give new hires? Do you set minimums related to amount of funding expected and publication output?
7. Do you have written policies about promotion and tenure? When do you explain the process to new hires? How often do you review their progress?
8. Do new hires get a lighter teaching load? Who picks up the slack, so to speak?
9. How much support do you receive as an administrator? Do you feel alienated from your faculty as an administrator?
10. What do you see as your primary role? What is your number one priority?
11. What are the major sources of stress for you?
12. What are the major sources of stress for new hires?
13. Describe the interview process for a new hire for me?

14. Have you had any formal training since becoming a department chair? What has the training focused on? Does your institution provide a manual for hiring new faculty?

15. Describe the level of collegiality in your department? Do most of your faculty cooperate and support each other? Do you have “out of office/lab” activities that draw you together as a group?

16. How is success viewed in this department? Do colleagues celebrate each other’s success? Do colleagues nominate each other for internal and external awards?

17. I am a new faculty member, how do I go about getting a grant? What is the best place for me to look for funding? Is there someone I should talk to? Should I go and visit someone?

Appendix B

Interview Protocol: Pre-Tenure/New Hire Focus Groups

1. What does the word mentoring mean to you? What does the word facilitation mean to you?
2. Tell me a story that illustrates how your expectations and the reality of faculty life were different? The same?
3. Did you feel welcome when you started your new job? Why or why not?
4. What made you take the job you are in? Did you have other offers?
5. How do you define success?
6. What makes a good department chair in the biological sciences? What does your department chair do that is good? Bad?
7. Describe the promotion and tenure process to me as you understand it? Did you receive anything in writing when you started this job? What does your department chair do to help you as you move towards your P&T process?
8. What are the major sources of stress for you?
9. What are some of the ways that your department chair supports your research efforts? Publishing efforts? Travel to conferences?
10. What types of programs should your institution have to help you be productive?
11. Give me an example that shows the collegiality or lack of by the other members of your department? If you think your department is collegial, what part does your department chair play in that outcome? Can you give me an example?
12. Does your institution value teaching more than research? Share an example of why you think this?

13. What sort of training programs would benefit your current department chair?
14. Would you want to be department chair one day? Why or why not?

Appendix C

Interview Protocol: Pre-Tenure Faculty Focus Groups

1. What does the word mentoring mean to you?
2. Does your department have a formal mentoring program?
3. Has your department chair been helpful in helping you build your career?
4. What do you expect your department chair to do to help you be successful?
5. Is your department chair doing a good job?
6. Is department chair leadership important in building a successful department?
7. What is the culture and climate of your department?
8. What is one example of how you were welcomed to your department as a new faculty?
9. What is your number one source of stress as a new faculty member?

Appendix D

Informed Consent Form

1. Study Title

Is there a method to the madness? A qualitative study of department chair facilitation methods used to assist pre-tenure biological sciences faculty research productivity

2. Performance Site

Louisiana State University and A&M College, Baton Rouge, LA

3. Investigators

Mr. Todd Pourciau
225-578-5833

Under supervision of Dr. Becky Ropers-Huilman
225-578-5892

4. Purpose of Study

The purpose of this research project is to explore the facilitation methods that department chairs in the biological sciences use to increase the research productivity of pre-tenure faculty.

5. Subject Inclusion

Individuals between the ages of 18 and 65 who do not report psychological or neurological conditions.

6. Number of subjects

15

7. Study Procedures

The study will be conducted using open-ended interviews between the subjects and the investigator. Each interview session should last between 60 and 90 minutes. Each subject will receive a copy of the transcribed interview and will be allowed to make corrections.

8. Benefits

The study will reveal methods and a possible theory about the facilitation methods of biological sciences department chair leadership.

9. Risks

The only study risk is the inadvertent release of sensitive information from the interview sessions. However, every effort will be made to maintain the confidentiality of the

interview records. Files and tapes will be maintained in a secure file cabinet at the investigator's home. The file cabinet is only accessible to the investigator.

10. Right to Refuse

Subjects may choose not to participate or to withdraw from the study at any time without penalty.

11. Privacy

Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law. This material will be used for my dissertation.

12. Signatures

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Institutional Review Board, 225-578-8692. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

Signature of Subject
Date

Vita

Todd A. Pourciau is a native of Baton Rouge, Louisiana. He will receive his Doctor of Philosophy in higher education leadership at the College of Education Diploma Ceremony in December 2006.