

Personal Meanings and Perceptions of Faculty Regarding Recognition and Reward
Among the Three University Missions

by

Maria E Hidalgo de Portillo

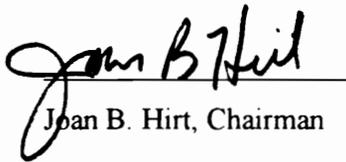
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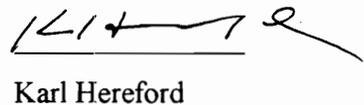
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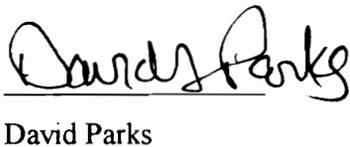
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Educational Administration

(Abstract)

After the remarkable expansion, and rapid growth of institutions of higher education (IHEs) between 1950 and 1970, campuses started to show signs of financial stress. By 1970, a number of institutions were faced with financial difficulties due to declining resources and steady increases in enrollment (Hansen & Stampen, 1981).

The support that American society and government provided for IHEs earlier this century has decreased, in part due to criticism surrounding management techniques. The general public and state legislators are calling for increased accountability, assessment, graduation rates, and faculty productivity in the three traditional missions of higher education: teaching, research and service.

These external demands have influenced the way work is conducted in all domains of the academy, including the faculty domain. There is little doubt that calls for improved undergraduate education, increased use of technology, a greater focus on applied (versus pure) research, and expanded outreach among others, have affected faculty teaching, research, and service activities. Yet research examining how these activities have shifted in recent years is very limited.

In parallel vein, the recognition and reward system of IHEs (e.g., merit salary increases, teaching load, equipment and facilities) encourage faculty to engage in certain activities that are more valued than other activities.

Traditional reward structures at many institutions have recognized research endeavors at the expense of teaching and service activities. It is reasonable to suggest, therefore, that if IHEs wish to shift attention among teaching, research and service endeavors of faculty, they need to design reward structures to recognize and value the activities they want faculty to undertake. There is very little evidence to suggest that IHEs have adapted their reward structures to promote such changes on the part of faculty.

Therefore, the present study elicits information about faculty perceptions of the way their teaching, research, and service activities have shifted in recent years and how reward structures have or have not been adapted to support these shifts.

The methodology used in this research is semi-structured interviews. Four departments at one university were selected for inclusion in the sample. From each department, ten faculty were randomly selected to participate in the study. The interviews were taped and transcribed to facilitate the analysis of the data.

Conclusions drawn from the study suggest that changes in teaching, research, and service have taken place in recent years. The majority of changes related to the use of technology, followed by changes in class size, teaching style, curriculum reform and the use of team work. Faculty perceived that teaching, research, and service activities have changed in recent years in response to internal and external demands, however, the recognition and reward systems have not changed to reflect those changes.

The results of this study suggest that both administrators and faculty may use these data to create new measures of faculty productivity that better reflect changes among the three university missions. The data may also provide other government and private agencies with different ways to assess institutional productivity.

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CHAPTER I

INTRODUCTION

The increase in American industrial productivity over the past 50 years has helped to generate a high standard of living in American society. Economic productivity grew at an annual rate of 3.2 % from 1948 through 1968, partially in response to the enormous amount of technological, scientific, and managerial development that occurred during this time. The period was one of rapid change, resulting in an increase in the per capita production of goods and services (Moen, Nolan & Provost, 1991). American industry was producing more than one-third of the world's goods and services while supporting only one-fifteenth of the world's population (Lehrer, 1982).

This increase in productivity was the result of many factors including: growth in the national economy, improved physical facilities, plant and process efficiency, creative products and services, responsiveness to customers' needs, governmental policies that promoted growth, and the availability of more services (Kendrick, 1980; Lehrer, 1982).

During the years 1969 through 1973, productivity growth dropped a full percentage point to 2.2 % annually. Spending for corporate research and development declined, while inflation accelerated, and productivity decayed considerably. Productivity continued to decline through the 1980s, resulting in a productivity growth rate of only 0.6 % (Riggs & Felix, 1983). In general, American industries and firms in the 1950s and 1960s did not encounter a decrease in productivity or worldwide competition like they did

in the late 1970s and early 1980s (Sink & Tuttle, 1989).

Productivity is an index of economic welfare. When productivity increases, more products and services are produced and a reasonable amount of resources is expended. Growth of real income is dependent upon the production of more goods and services. In competitive markets, where prices reflect the cost to produce items, increased productivity is translated into greater job availability and a better quality of life (Edosomwan, 1995; Kopleman 1986). Decreased productivity leads to poorer living conditions and accelerated inflation.

At the global level, inflation, trade competition, and employment rates are directly affected by productivity rates and the quality of goods and services produced. Continual improvement in productivity is directly related to continued economic growth (Edosomwan, 1995; Moen, Nolan & Provost, 1991). In the 1990s, most nations are concerned with improving their standard of living and quality of life, most organizations are concerned with increased profits and market shares, and most customers are concerned with the quality of products and services (Edosomwan, 1995; Moen, Nolan, & Provost, 1991; Sink & Tuttle, 1989).

Global competitive pressures are causing organizations to change and restructure their traditional management styles. They have been challenged to find ways to better meet customers' needs, reduce inflation, and increase productivity. The growing dissatisfaction with the indices of productivity in organizations has led them to be more concerned with developing different techniques to improve productivity, and to implement strategies for

success in a highly competitive market (Edosomwan, 1995). According to Lehrer (1982), managers in organizations must continually seek better, and less expensive, ways to perform their business functions if they want to survive within the competitive economy and society of the future. If an organization wants to succeed, its management must discard the traditional ways of managing organizational performance and implement innovative strategies to increase productivity (Sink & Tuttle, 1989).

In recent years, measuring productivity has been a central theme in many organizations. It enables managers to examine growth, development and change within their organizations (Sink & Tuttle, 1989). Prokopenko (1987) argued that productivity in an organizational system is always evolving according to the influence of social and economic pressures, including economic growth, changes in the national budget, control of inflation, and the availability, and quality, of the labor force. Because of the diversity of factors affecting it, productivity measurement requires not only quantitative approaches, in terms of input and output ratios, but also qualitative approaches, in terms of the internal and external factors which have affected productivity.

A parallel phenomenon has occurred in American institutions of higher education (IHEs). Between 1950 and 1970, a record of remarkable performance, expansion, and rapid growth characterized IHEs (Hansen & Stampen, 1981). Administrators were under pressure to meet the challenges resulting from this growth. As the post-World War II generation turned 18, not only did the college-age population increase, but the proportion of young people seeking higher education opportunities rose steadily. This growth

prompted extensive building and expansion by colleges and universities (Kerr & Gade, 1981). More important, this expansion was supported by the general public, who thought of IHEs as strong centers of teaching and learning.

However, toward the end of the 1960s, signs of financial stress were apparent in the world of higher education, and, by 1970, a number of institutions were faced with financial difficulties due to declining resources from public sources and steady increases in enrollment (Hansen & Stampen, 1981).

In the late 1980s and 1990s, IHEs faced economic problems because the total state funding to these institutions declined. As a result, many programs have been restructured or eliminated, operating expenses have been reduced, federal support for research and student financial aid has decreased, and tuition rates have increased (Kennedy, 1995).

Nationally, many IHEs, especially public institutions, are confronting issues of rapid inflation and inadequate budgets. Problems confronting IHEs are but one piece of the whole picture facing states in the 1990s. Hauptman (1993) points out that IHEs are affected by the current economic situation because they are competing with other social organizations for resources. Social programs like health care, welfare, anti-crime activities, and drug abuse interventions, compete with IHEs for resources in the current economic climate (Layzell, Lovell, & Gill, 1994; Miller, 1994).

Although IHEs have been affected by diminished resources in recent years, they continue to serve three important purposes in American society. First, IHEs create

knowledge that addresses important social issues like crime, substance abuse, technological issues, and environmental issues, to name but a few. Second, the knowledge produced by IHEs can be applied to the many problems confronting society. Third, because of the complexity of modern life, the number of educated workers necessary to resolve social needs is great. IHEs train such workers, who in turn, work to develop natural resources, increase productivity and raise the standard of living. In short, students that these institutions educate seem to hold great promise to address societal needs and expectations.

The support that American society and government provided for IHEs between 1950 and 1970 has decreased, in part, due to criticism surrounding management techniques which have not been wisely used to control costs in IHEs. Just as other agencies and industries are downsizing, government expects IHEs to create more efficient management systems and to impose greater budget controls to justify their expenditures (Byrd, 1994; Hauptman, 1993; Miller, 1994).

External constituencies have pressured institutions of higher education (IHEs) in recent years to increase productivity, frequently suggesting what these institutions might do (Heydinger & Hasan, 1992). Administrators feel that these pressures, coupled with dramatically diminished resources, restrict their ability to achieve excellence in the three traditional missions of higher education: teaching, research, and service. Faculty, in turn, believe that external interventions constitute a threat to academic freedom and they

misrepresent the value of what faculty do. Yet, both administrators and faculty are facing a changing environment that increasingly involves external intervention and restriction. These pressures have serious implications for academic productivity among IHEs (Miller, 1994; Jordan, 1994).

The current period of declining financial resources complicates the possibility that institutions may become more productive (Alpert, 1985; Cameron & Tschirhart, 1992). Although IHEs have been compelled to use their resources more efficiently and wisely, they continue to require sophisticated and expensive equipment, highly trained faculty, and extensive facilities, all of which render higher education a very expensive enterprise. Bowen (1980) argued that if IHEs are to continue to pursue excellence and prestige, it will be necessary to have resources available to support superior teaching and research. Such demands for excellence and prestige constrain the academy's ability to conserve resources and control cost.

In order to comply with demands to control cost and increase productivity, IHEs have responded in different ways. According to Alpert (1985), many institutions have opted to maintain the status quo instead of eliminating nonproductive programs and creating new programs that increase organizational productivity. Adams and Palmer (1993) report that other IHEs have raised tuition and fees, reduced course offerings, increased faculty workload, reduced library acquisitions, maintenance and supplies, and eliminated vacant positions. Many of these decisions and reforms have limited the ability of IHEs to function efficiently and generated public skepticism about the mission of IHEs.

Given these circumstances, organizational productivity is under close scrutiny by state and federal governments. They are asking for greater accountability, and rethinking the responsibility that IHEs have to society. The public, and legislators believe that colleges and universities could be more productive if faculty work is adjusted to reflect societal needs. This emerging movement toward accountability and productivity has posed some interesting questions: What do faculty really do and how do they allocate their time to earn their pay? Is society getting better solutions to its problems from faculty? Is government getting a return on its investment in faculty? (Miller, 1994).

The external perception of IHEs in terms of productivity has grown increasingly critical. Government and society are asking these institutions to do more with less. They are demanding that institutions bring in more revenue from external sources and avoid unnecessary expenditures. According to Birnbaum (1992), there is no simple way that administrators can increase productivity levels due to the multiple and complex factors that influence the nature of IHEs. In this respect, Creswell (1985) argues that to increase productivity as well as to evaluate and reward it, administrators must develop multiple measures of faculty performance that reflect the multidimensional nature of faculty work. They must understand the interests, and attitudes of faculty, as well as the distinct nature of the different disciplines (Baldwin & Blackburn, 1981).

Although productivity has been a very challenging issue for academic administrators to understand and manage, and there are many difficulties in developing a conceptual framework to measure faculty productivity (Gallagher, Hossler, Catania &

Kolman, 1986), IHEs, like other organizational systems, must perform internal evaluations to measure and evaluate faculty productivity in response to external demands. According to Byrd (1994), IHEs must be able to implement measures of faculty efforts if they are to adequately and accurately assess whether they are meeting their missions. Cooper and Hensley (1993b) state that:

The characterization and analysis of existing faculty and productivity reporting systems is a vital first step in assessing the efficiency of existing reporting systems to meet the education and research needs of America in the 21st century. It should provide empirical information that can lead to a new set of measures of faculty productivity that are acceptable to faculty and more useful to government agencies, private sponsors, and the general taxpayer (p.3).

The problem is not that productivity is inadequate for evaluating faculty work in IHEs. Rather, the problem is that productivity in educational organizations is evaluated differently than in industrial settings. Using the term “productivity” uncritically in IHEs may cause one to overlook some crucial aspects of academic work. For example, in evaluating faculty work, unclear definitions of academic productivity may result in mistaken judgments of academic worth. If the term “productivity” is used to measure faculty work, it is necessary to determine what aspects of faculty work are being measured, for example teaching load, community service, impact on students, opportunities to obtain grants, or applicability of research results. In the absence of

conceptual clarity, judgments about faculty, both in general and at the individual level, may mask true faculty accomplishments (Birnbaum, 1992; Cooper & Hensley, 1993a).

Despite demands by external constituencies for efficiency in the use of resources, the problem of measuring of productivity is a recent phenomenon for IHEs (Cooper & Hensley, 1993b). There are different ways in which faculty work is measured. In university settings, measures of faculty productivity range from considering teaching hours per week, credit hours, and student contact hours, to the number of articles and books published, community service rendered, number of citations, and quality of peer evaluations (Creswell, 1985). However, when faculty are evaluated by external constituencies, the language is focused on quantitative factors. Evaluators are more concerned with numbers like student-teacher ratio, teaching hours per week, and graduation rates than qualitative aspects of faculty work like quality of student advising, applicability of research results, use of technology in instructional activities, or impact on students. They consider measurements of productivity only in terms of input-output ratios, without understanding that academic outcomes are diffuse, and difficult to measure. According to Reagan (1985), it is sometimes argued that faculty efforts, when viewed by external constituencies, are measured through quantitative approaches, while faculty work within the university is more focused on qualitative approaches.

Administrators do evaluate faculty quantitatively. For example, they examine the number of students advised, faculty teaching hours, articles in refereed journals, and papers presented to learned societies. These data are frequently used to allocate

institutional resources (Reagan, 1985). Some administrators disagree with funding based solely on numbers, because when productivity is measured solely by quantitative factors, important aspects of academic work may be ignored (appropriate class size, quality of advising, impact of research results, technological innovation in the teaching-learning process, and community service). Although educational leaders may find it necessary to evaluate productivity quantitatively when dealing with external forces, they agree that broader and more comprehensive measures of faculty work that reflect recent changes among teaching, research, and service should be considered when allocating resources internally and when recognizing and rewarding faculty work (Adam & Roberts, 1993; Miller, 1994).

Faculty may also disagree with tying resources and rewards to quantitative factors, but they must answer the question of how more comprehensive measures that reflect the variety of faculty work should be used in evaluating how they spend their time.

Faculty productivity is closely related to institutional recognition and reward systems. If recognition for some activities is greater than for others, faculty will engage in those behaviors most likely to garner rewards. Since World War II, research productivity has been more highly valued, hence more rewarded, than instructional or service activities at most IHEs (Adam & Roberts, 1993; Mingle & Heydinger, 1994; Miller, 1994; Seldin, 1984). In recent years, however, public and legislative demands for improved teaching, advising, and outreach activities have prompted IHEs to reconsider and, in some cases, reconfigure the balance among instruction, research, and service (Adam & Roberts, 1993;

Miller, 1994). At issue, then, is whether recognition and reward systems have been adjusted to reflect this shift among institutional missions.

Faculty work traditionally has been evaluated and rewarded through a number of quantitative measures. These standards have been useful measures of some faculty activities, particularly research endeavors (Creswell, 1985; Fairweather, 1993; Tuckman & Hagemann, 1976). However, these measures may fail to reflect the wide variety of activities in which faculty have been involved when striving to achieve the university's mission with respect to teaching and service (Adam & Roberts, 1993). Despite administrative efforts to bring teaching, research, and service activities into parity (Bowen & Schuster, 1986), research continues to be the most recognized activity when promotion, tenure and salary decisions are made (Fairweather, 1993; Seldin, 1984).

As IHEs have attempted to balance teaching, research, and service (Fairweather, 1993; Roberts, Wergin & Adam, 1993), faculty have been called on to adopt innovative pedagogies, increase their use of technology in teaching activities, expand their outreach efforts, and conduct more applied (as opposed to pure) research activities. These changes in the roles and functions of faculty work must be understood if IHEs want to implement more valid and accurate measures of faculty performance and link those measures to a reward system that brings teaching, research, and service into parity (Adam & Roberts, 1993).

In redefining productivity, it is essential to examine faculty work, faculty perceptions regarding how teaching, research, and service activities have changed in

recent years and how the reward structure has, or has not been adjusted to reflect those changes. It is critical to explore how faculty would like their work to be evaluated and rewarded, and what they consider to be valid rewards that reflect changes among teaching, research, and service.

The problems associated with measures of faculty work have been widely discussed, but not well documented. Research on faculty perceptions regarding teaching, research, and service has revealed faculty concerns about the criteria used to measure their work. For faculty, such measures are not accurate because they do not reveal the real nature of their work (Cooper & Hensley, 1993a; Cooper & Hensley, 1993b; Gallagher et al. 1986; Miller, 1994; Reagan, 1985).

Another problem related to faculty work in academic settings is the presence of institutional factors that constrain faculty work. Managerial practices, institutional procedures, reward systems, external pressures, evaluation standards, and resource allocation systems are frequently mentioned as constraints to faculty work (Baldwin, 1985; Birnbaum, 1991; Gallagher et al., 1986; Colbeck, 1994).

These circumstances call for a close examination of how faculty perceive they have been recognized and rewarded in teaching, research, and service activities, and how these activities have changed in recent years. Research examining how faculty perceive the future responsibilities in teaching, research, and service activities, and how they would like to be recognized for their efforts, would be valuable to administrators and external constituencies when decisions about evaluating and rewarding faculty are made.

Purpose of the Study

The purpose of this study was to examine how teaching, research, and service activities of faculty have changed in recent years, and how the reward structure has, or has not been adjusted to reflect those changes. Specifically, this study is designed to address six broad questions.

In terms of faculty perceptions about teaching, research, and service:

1. What teaching, research and service activities are faculty currently engaged in?
2. How have these activities changed in recent years and how have these changes shifted attention among teaching, research, and service?
3. How do faculty perceive future trends in terms of these changes?

In terms of faculty perceptions about recognition and rewards among teaching, research and service activities:

4. In what ways are these activities currently recognized and rewarded?
5. Have recognition and rewards changed in recent years?
6. In what ways should these activities be recognized and rewarded in the future?

Significance of the Study

Several constituencies may benefit from the present research. First, faculty may be prompted to reevaluate their activities and how those efforts are valued and rewarded.

Second, administrators may use the results of this study to redesign reward

systems so that they reflect the recent changes among teaching, research and service activities. Such reconfigured systems may motivate faculty to produce more work in desired areas.

Finally, external constituencies (e.g., legislators, state-wide boards) may use the results of the present research to more accurately assess faculty productivity as it relates to the teaching, research, and service missions of IHEs.

Organization of the Study

This study is organized in five chapters. A description of the problem to be studied, the purpose of this study, and its implications have been provided in Chapter I. Chapter II offers a review of research related to the phenomenon under study. Chapter III presents a description of the methodology employed in this study and includes sampling procedures, data collection techniques and data analysis strategies. Chapter IV reports the results of the data collected. An interpretation and discussion of the results, conclusions that may be derived from the study, and recommendations for future research and practice are provided in Chapter V.

CHAPTER II

LITERATURE REVIEW

Faculty work in educational settings does not occur in isolation. It is part of a much larger and more complex system guided by rules, procedures, norms, and values. Much of the confusion surrounding the current situation over faculty work comes from the misunderstanding about what faculty do and how they spend their time among teaching, research and service activities in the ever changing environment of the academic world. Administrators and policy makers need to understand the diversity of components of faculty work, faculty adherence to a particular discipline, their changes in attitudes and interests, and the diversity within universities, to be able to establish evaluation systems that consider the inapplicability of uniform standards to all types of institutions. New recognition and reward systems that emphasize the changing and developmental aspects of faculty work must be developed.

Measuring faculty productivity becomes important when the link between productivity and budget allocation is considered. In order to understand the present research on faculty productivity, an overview that synthesizes the literature and research conducted to date on this subject was necessary. In this review, six major categories of research were examined. First, a summary of how productivity traditionally has been measured is provided. It illustrates the different approaches that have been taken to define productivity in business and the academy. Second, traditional measures of faculty

productivity are reviewed. Third, measures of content and quality in faculty performance, including citation analysis and peer review, are discussed. Fourth, literature on qualitative measures of faculty productivity is examined. Fifth, studies that identified factors which affect and determine faculty productivity are discussed. These studies examine particular factors associated with faculty productivity, including resources, age, institutional context, and reward structures. Finally, cultural differences among academic disciplines are discussed, and an organizational model that relates to the present research is presented. This model, developed by Biglan (1973a, 1973b), and discussed by Smart and Elton (1975, 1976, 1982), Smart and McLaughlin (1978), and Muffo and Langston (1981) provides a rationale to study faculty perceptions of productivity.

Definitions of Productivity in Business and Academe

The term “productivity” is difficult to define and interpret because it is used in a variety of ways in different contexts. People tend to use “productivity”, “effectiveness”, and “efficiency” interchangeably when, in fact, they are different, though related, terms (Birnbaum, 1991; Ingster, 1977; Kallio & Ging, 1985; Massy & Wilger, 1995; Reagan, 1985; Rush, 1992; Schalock, Cowart & Staebler, 1993; Trachtenberg, 1992; Wallhaus, 1975).

“Effectiveness” refers to the extent to which the resources are distributed to achieve the proposed objectives (Birnbaum, 1991; McLeod & Atwell, 1992; Prokopenko, 1987; Ratcliff, 1984). In industrial settings, “effectiveness” is operationally defined as the accomplishment of established objectives, on time, and with the quality specified (McLeod

& Atwell, 1992; Sink & Tuttle, 1989). Alpert (1985) argues that effectiveness is determined by the ability of an organization to meet the demands of the various groups that are concerned with its activities. In contrast, Campbell (1976) posits that organizational effectiveness is a construct that does not have an operational definition, and is difficult for managers to measure. However, managers tend to use this construct based on the assumption that organizations establish goals that can be measured to determine if resources are being distributed judiciously or if they being used too quickly.

“Efficiency” is an internal standard of performance used to determine how well an organization is doing, and is measured by the ratio of resources utilized to output produced (Alpert, 1985). Efficiency is related to how much is accomplished in the shortest period of time given the amount of resources allocated. In other words, efficiency equals the expected outcomes divided by the resources actually consumed (McLeod & Atwell, 1992; Prokopenko, 1987; Sink & Tuttle, 1989).

“Productivity” has been defined in a variety of ways (Edosomwan, 1995). Some scholars have defined productivity in very vague terms, others in more specific terms, but nearly all relate productivity to the ratio between outputs and inputs (Baker, 1991; Birnbaum, 1991; Cooper & Hensley, 1993a, 1993b; Edosomwan, 1995, Ingster, 1977; Kendrick, 1977; Olson, 1994; Ratcliff, 1984). Considering productivity in terms of input-output ratio is a definition that works well in industrial organizations. In such settings, it is possible to calculate the necessary inputs to produce specific outputs. The combination of inputs necessary to produce outputs can be predicted with a high degree of accuracy

(Birnbaum, 1991; Kallio & Ging, 1985; Lantos, 1971; Massy & Wilger, 1995; Schalock et al., 1993). Such a definition calculates gross productivity as a function of production (Edosomwan, 1995; Kendrick, 1977; Massy & Wilger, 1995).

The use of this definition of productivity in educational settings is more controversial. Borrowed from business, this definition presents several shortcomings when used to measure productivity in the academy (Kallio & Ging, 1985). Considering productivity in terms of student-faculty ratio, instructional hours, or numbers of papers published, offers only partial measures of faculty work, and does not take into account other factors that characterize work in the academy (Birnbaum, 1991; Massy & Wilger, 1995; Reagan, 1985). Productivity is a very complex term when applied to educational settings. Many researchers argue that educational institutions do not produce things in the way that industrial organizations do; that they do not transform raw materials into finished products. These scholars suggest that educational institutions provide means, and students use those means to obtain formal education (Duc-Le To, 1992; Reagan, 1985; Schalock et al., 1993). Schalock et al. (1993) reported that it was difficult to imagine any input into the educational process that was not in some way affected by its interaction with other inputs into the process, rendering it necessary to consider more appropriate techniques when evaluating the essence of academic work. If productivity in education is assumed to resemble that in industrial organizations in terms of total benefits and total costs, questions about who benefits, and how the benefits are produced by universities are raised (Kallio & Ging, 1985; Massy & Wilger, 1995; Olson, 1994).

A vast majority of research about faculty productivity considers gross productivity, ignoring the wide range of variables involved in academic work and the differences in quality, or value, of those variables (Olson, 1994). The nature of educational institutions makes it difficult to define and measure their productivity. Different perceptions of productivity in educational settings are explained by the existence of a wide range of roles, functions, and missions of educational institutions (Birnbaum, 1991; Wallhaus, 1975). Therefore, to understand and measure academic productivity, it is necessary to specify the contextual framework in which it is applied, and to include as many variables as possible in order to produce more accurate and valid measures (Birnbaum, 1991; Partner, 1993; Wallhaus, 1975).

In short, in defining and measuring productivity in higher education it is critical to consider not only how efficiently institutions provide services, but also whether the institutions accomplish the proposed goals and objectives of the institution. In other words, “productivity” is the combination of “effectiveness” in accomplishing institutional goals, and “efficiency” in using the available resources (Birnbaum, 1991; Wallhaus, 1975). Given that general definition of academic productivity, it is important to examine research that explores faculty productivity in higher education.

Traditional Measures of Faculty Productivity

Higher education is not at the top of most states’ funding agendas. Funding will be tighter during the next decade. As funding decreases, campus administrators will look for

ways to improve productivity, and legislators and other stakeholders will ask for evidence that their investments are being used efficiently and effectively. Administrators use campus productivity reports not only to make decisions to improve organizational productivity, but to allocate resources according to the different goals of the institutions. Faculty productivity is one important element of campus productivity, hence merits that attention of administrators (Ashar & Shapiro, 1990; Dill, 1982; Hauptman, 1993; Heydinger & Hasan, 1992; Kallio & Ging, 1985; Shapiro, 1993).

Measuring faculty productivity provides administrators with useful information to determine how, and in what areas, faculty need to improve. It provides an index of progress, helping institutions to develop new standards of performance (Ratcliff, 1984). Despite the fact that the evaluation process can be threatening and ill-defined, sometimes resulting in inappropriate decisions, evaluation of faculty work is necessary (Centra, 1977). In times of budget reductions, measuring productivity is a means to improve faculty development (Reagan, 1987; Schalock et al, 1993; Yuker, 1984), and to make decisions related to tenure and promotion (Centra, 1977; Braxton & Bayer, 1986).

Traditionally, faculty work has been measured considering faculty performance in each of the three different missions of the academy: teaching, research, and service. This tripartite mission has been useful to study faculty contributions in these three roles. However, to assess faculty work based on separate measures of these three activities tends to produce only partial information about faculty productivity (Blackburn, 1974). Measuring faculty work accurately requires a global approach that includes the many

different activities in which faculty are involved. Only then can administrators establish reward systems that reflect faculty contributions to institutional missions.

Traditionally, faculty productivity has been measured using quantitative standards. One of the main problems in measuring faculty productivity in quantitative terms is that many faculty products are intangible (quality of teaching, quality of student learning, quality of publications) (Blackburn, 1974; Hopkins, 1990; Kallio & Ging, 1985; Massy & Wilger, 1995; Reagan, 1985; Schalock. et al., 1993).

An extensive body of literature exists on measures of faculty productivity using quantitative standards, particularly productivity measured by research (numbers of publications, books, chapters in books). Braxton and Bayer (1986) point out that books and journal articles are the major categories used to measure faculty research performance, however, journal articles as well as books present problems because of the variety of forms in which such texts are published.

Bieber and Blackburn (1993) report measures of productivity in terms of publication rates based on the amount of space available in journals for faculty to publish their research, and the number of faculty competing for such space. Some degree of increased faculty productivity can be explained simply by significant increases in the number of available journals.

Meador, Walters and Jordan (1992) report that faculty productivity, as measured by number of publications, can be explained by the size of the department, grant support, availability of graduate students, and quality of library.

While some measures of productivity are related to the size of the department, the relation between productivity and quality of department remains unclear. Clement and Sturgis (1974) found that the quality of department of doctoral training has less impact on faculty productivity than has generally been assumed. Complex measures, and diversity among disciplines, make the relationship between productivity and discipline difficult to determine (Finkelstein, 1984). Differences in the field of study explain, in part, the variations in faculty productivity (Blackburn, Behymer & Hall, 1978; Warner, Lewis & Gregorio, 1981).

Bonzi and Day (1991) found that faculty productivity, as measured by publication rates both in total publications and type of publications, varies between the most senior and most junior faculty but not among intermediate groups. They found that publication rates were related to promotion and rank in natural sciences and humanities. Ramsden (1994) reports that faculty productivity, as estimated by quantity of publications, is related to commitment to teach, intrinsic motivation, and departmental environment.

Faculty productivity has been also measured by its relation to the productivity of graduate students (Gallagher, 1986). Nearly 26% of the variance in faculty productivity was explained by the professional age of the graduate students, previous productivity while they were graduate students, and productivity of the advisor.

Still other scholars have examined productivity in relationship to instructional responsibilities. Fox (1992b), investigating the relationship between teaching and research, and their relationship to publication productivity found that interest, time commitment,

and orientation to teaching were associated with depressed publication productivity, while research was associated with an increase in publication rates.

Some scholars have also examined faculty productivity at different types of IHEs. Harder (1981) measured faculty productivity by publication rates, teaching, and service activities in doctoral granting colleges and non-doctoral granting institutions. Quantitative estimates of the three areas (teaching, research and service) showed that research and scholarship were more important factors at doctoral granting campuses, while teaching was more important in non-doctoral granting schools.

The relationship between scientific productivity and academic position has also been explored. Long (1978), and Long and McGinnis (1981), corroborated previous research that faculty productivity is facilitated by departmental location and prestige, though it does not play a significant role in hiring decisions.

Productivity has also been examined according to the prestige of institutions and personal characteristics of the researcher. Fulton and Trow (1974) found that faculty interest in research and prestige of institution determine faculty involvement in research activities. In high prestige universities, almost 80% of the faculty had published in the previous two years, and over 25% had published more than five articles during that time period. Despite the differences in time available to do research, faculty in higher prestige institutions were more likely to be interested in research than faculty in lower prestige institutions.

Measures of productivity in terms of number of research publications or citation analysis has been used to study the distribution of productivity among scientists over time. Allison and Stewart (1974) reported an unequal distribution of productivity among scientists over time, suggesting that there is a cumulative affect over time and that scientific productivity is not limited to the early career years.

Measures of Content and Quality in Faculty Performance

In addition to the extensive literature on measures of faculty performance based on quantitative factors, there are also measures of faculty work which emphasize the content and quality of the faculty work.

The assessment of individual faculty performance in research has traditionally been focused on publications in the form of books, monographs and referred journals (Braxton & Toombs, 1982). However, approaches other than publication counts have been used to evaluate the quality of faculty contributions to a particular field, including citation analysis. Citation analysis is a special form of bibliographic research that assumes that citation frequency can be used to assess the significance of scientific contributions of individual scientists and academic departments. It examines quality of a publication through its significance and impact, validity of methodology, analysis, conclusion, the clarity of presentation, and measures the number of times other scholars cite a particular work (Braxton & Bayer, 1986; Cole & Cole, 1967; Creswell, 1985; Lawani, 1977; Wade, 1975). Lawani (1977) argued that even though the published contributions of a scholar

have traditionally been measured in terms of quantity, quality is a matter of concern among scholars. In assessing quality, the most common methods have been: to ask others in the same field to assess the quality of a published contribution; to consider the reputation of the journal in which it was published; and, to consider the citation analysis.

Lawani and Bayer (1983) reported evidence on the validity of citation as a criterion to measure the impact of scientific scholarship. In selecting 870 cancer research papers, they found that highly rated papers are more highly cited over a period of five years after publication.

Citation practice has been employed not only to enhance professional contributions and reputations, but also to acknowledge within the academic community which faculty influenced other scholars' ideas, and which areas of a discipline merited funding (Braxton & Bayer, 1986).

Citation analysis has been widely used to measure the quality, significance, and impact of scientific productivity (Gilbert, 1977). Lindey (1980) pointed out that in determining the contribution of a scientific work, two variables need to be considered: the product itself and its quality. However, citation analysis as a means to measure quality has some shortcomings. It excludes some forms of faculty productivity, particularly in the humanities where the creation of art in a variety of forms is the norm, or in other disciplines where multiple authorship is common. For example, Moravesik and Murugesan (1975) examined 30 randomly selected articles on a single topic (theoretical high energy)

and concluded that the practice of citation analysis can sometimes cast doubt on the validity of conclusions and policy decisions drawn from such analysis.

Citation analysis has been employed to measure departmental prestige. Hagstrom (1971) identified several variables that explain departmental prestige, and found that a combination of an average production of research articles and an average number of citations account for half of the variance in the departmental prestige. However, citation of published work is a better predictor of departmental prestige than quantity of articles published.

Kroc (1984) conducted a study in 53 schools of education which had been highly ranked in studies of quality and productivity. He concluded that while citation analysis is not immune to error or criticism, it is a simple and appealing method to evaluate scholarly work.

Bayer and Folger (1966) investigated the publication records of biochemistry doctorates and reported that almost twice as many graduates of low quality departments (as opposed to those in high quality departments) had no citations in journals covered by the Science Citation Index.

Hollingsworth and Reutzel (1994) explored the institutional productivity rating of reading faculties. Eight reading journals and the 25 most highly rated reading departments were selected for the study. They found that even though the number of articles published in the selected journals did not account for all the tasks associated with scholarly work in reading education, departmental productivity based on publication rates is a valuable

measure of quality of scholarly productivity which should be considered in promotion and tenure decisions.

O'Neill and Sachis (1994) established that tenure and promotion in most universities are based on the tripartite model. That is, a faculty's performance is assessed in terms of teaching, research, and service. However, their study focused on the importance of refereed publication in tenure and promotion decisions, and they found that publication in refereed journals was more important than publication in non-refereed journals when tenure and promotion decisions were at stake.

Another measure of faculty performance is rating by peers. Peer assessment as a measure of faculty performance has been conducted both within institutions and with the help of external experts (Creswell, 1985). In evaluating teaching performance, the evaluation of peers should provide more valuable information to measure faculty work than the traditional student evaluation. However, Centra (1977) and Creswell (1985) reported that peer evaluation based on infrequent classroom observation does not produce valuable information for tenure and promotion decisions. When peer rating is supplemented by the use of external experts, it might produce more valuable data. However, the reliability of this technique is diminished when faculty to be evaluated are asked to suggest names of peer evaluators, (Centra, 1977). Peer rating of teaching performance could be more reliable if it is accompanied by faculty self-report. This self-report, or portfolio, should include the instructor's qualifications, the course syllabus and

objectives, the reading list, materials used in the classroom, assignments and tests, course projects, and pre-tests and post-tests (Centra, 1975; Centra, 1977; Seldin, 1990).

Stallings and Singhal (1970), in studying the association between publications and peer teaching, reported that in one university, where a reliable instrument for student evaluations was administered, small, statistically significant, linear correlation with research productivity resulted. In a second university, where an instrument of unknown reliability measured student evaluations, no statistically significant correlation between research productivity and measures of faculty effectiveness were found.

While peer evaluation in teaching has been used as a way of improving instruction, this form of evaluation has not always been recognized by faculty. Menges (1991) reported that peer evaluations used in conjunction with student evaluations and exit surveys were considered by faculty as incompatible with academic freedom, and represented a way to control faculty work.

Peer rating has also been used as a criterion to measure research performance. Cole (1979b) examined the differences in reputational standing of academic departments as evaluated by peers as a function of research output. He found that scientific research performance is a significant predictor of reputational standing as evaluated by peers.

Peer review has also been used as a means to allocate research funds. However, this procedure has been under attack due to the lack of effective control and accountability, which resulted in peer reviewers who were inclined to support certain scientists and their projects (Cole, Rubin & Cole, 1978).

Qualitative Measures of Faculty Productivity

Because scholarly work includes a wide range of tasks which are not always reflected in publication rates, researchers have identified broader measures of faculty work. Most of these measures focus on faculty contributions and their ability to garner grant money, the writing of research proposals, the development of new programs and curricular reforms, the development of software in computer areas, and the number of proposals accepted for funding (Braxton & Bayer, 1986; Braxton & Toombs, 1982; Pellino, Blackburn & Boberg, 1984).

Another way to measure faculty performance considers the impact and influence of American universities on the development of the global economy. Muffo (1986) pointed out that even though academic and political worlds are different, universities are considered by public policy makers as centers of learning and expertise where people learn skills applicable to the economic development of American society. Therefore, one means to assess faculty performance is to determine the extent to which faculty work impacts policy makers.

In contrast to the extensive literature on faculty productivity as measured by quantitative indicators, there is very little research on qualitative measures of faculty work. Massy and Wilger (1995) made an important contribution by providing information about faculty perceptions of productivity and factors affecting their productivity. They reported that faculty see intrinsic motivators and institutional rewards as important factors in research activities. Faculty expressed their dissatisfaction with measures of productivity in

terms of input-output ratios, because such measures do not consider quality issues. Rather, faculty prefer productivity be measured through qualitative attributes. Other faculty saw productivity as dependent on the availability of resources. Faculty also reported that teaching takes time away from research activities. Finally, faculty expressed their concerns about the importance of bringing academic goals into greater congruence with expectations of external constituencies, and made a case for applying new qualitative measures in education as opposed to the traditional quantitative ways of measuring productivity.

Some scholars have explored faculty perceptions of productivity measures (Cooper & Hensley, 1993a, 1993b; Massy & Wilger, 1995; Ross & Donnellan, 1991). In general, faculty report that: productivity usually is defined in terms of publications, while teaching and service are ignored; universities are institutions that have coalitions of individuals with different priorities and activities; and, there is not clear agreement on standards for measuring, and increasing productivity.

Ross and Donnellan (1991) conducted a study to explore faculty and administrative perceptions of productivity and what standards of scientific productivity were applied to faculty. They reported that judgments about productivity are subjective evaluations made by human beings. Faculty and administrators have very different ideas about what productivity is, and what appropriate standards should be employed to measure and increase productivity. Administrators see universities as linked to the rest of society through their research endeavors. Faculty, on the other hand, are interested in

processes and products of their work. Therefore, the authors encourage constant dialogue between administrators and faculty to identify new ways to evaluate their work.

To examine whether faculty behavior changed as a consequence of incentive policies, Colbeck (1994) studied two departments in two different universities. She explored faculty perceptions of, and responses to, institutional and departmental policies, and reported that the way in which faculty perceive policies and rules governing their work determines how they allocate their time. Faculty expressed their dissatisfaction with policies that ensure that teaching occurs while institutional factors constrain their work. What administrators reported as important was not what mattered to faculty. Some policies presented by administrators as incentives were perceived by faculty as pressure, and were not likely to motivate faculty. Annual merit increases mattered less to faculty than administrators. Faculty believed that administrators use merit raises to manipulate, rather than empower. Within each department, there were policies that influence faculty work, and interact with other policies and university missions, department values, available resources, and individual goals and preferences. For example, while administrators said that merit increases in salary were an important way to reward teaching, faculty argued that increases were actually awarded to those who made important research contributions.

A final area of research has focused on differences in perceptions of productivity among disciplines, as evidenced in Bonzi's (1992) work. He found significant differences between faculty in sciences and mathematics, and those in other disciplines. Quantity and quality of publications were perceived as the major components of productivity among

faculty in mathematics and sciences, and the number of publications was perceived by most respondents as very important for tenure and promotions decisions.

A body of research has been produced on improving measures of productivity. Many of these studies have focused on the design of measurement instruments, evaluation processes, characteristics of the rater, and performance appraisal interviews (Heydinger & Hasan, 1992; Kopleman, 1986).

The most common measures of productivity are focused on the relationship between outputs and one or more associated inputs used in the production process (Birnbaum, 1991; Duc-Le To, 1992; Edosomwan, 1995; Kendrick, 1977; Kopleman, 1986; Prokopenko, 1987). This approach is product-oriented and educational settings operate differently from industrial settings (Birnbaum, 1991; Cooper & Hensley 1993a, 1993b; Ingster, 1977; Massy & Wilger, 1995; Reagan, 1985; Ross & Donnellan, 1991). When a quantitative approach is employed in educational settings, faculty perceive that their work is devalued. Faculty consider such measures as deficient because they rate only a portion of the total domain of faculty work (Cooper & Hensley 1993a, 1993b; Lawrence, Trautvetter & Balckburn, 1989; Massy & Wilger, 1995; Pellino, Blackburn & Boberg, 1984; Reagan, 1985; Ross & Donnellan, 1991; Olson, 1994; Yaker, 1984).

Birnbaum (1991) argues that the complex nature of academic settings obscures the meaning of productivity measurements when quantitative indicators are applied. Massy and Wilger (1995) suggest that new, and more accurate, approaches to measure faculty productivity must be developed. Reagan (1985) argues that since human activity is at the

core of educational institutions, they do not create products like industrial settings, therefore measures of productivity must not be limited to quantitative approaches. Baker (1991) posits that quantitative indicators make it difficult to consider quality and institutional values when measuring productivity. Ingster (1977) points out that, in educational institutions, some activities can be measured using quantitative indicators but such indicators are not relevant when measuring faculty work. These standards could work in academic settings if the quality of work performance could be identified. Gallagher (1986) establishes that one of the main problems in applying quantitative indicators is the difficulty in defining inputs and outputs of the academy. Lantos (1971) suggests that measures of productivity in education would be easier if the inputs and outputs of the process were clearly defined, controllable, and tangible.

Gallagher (1986) suggests that a single standard of faculty productivity cannot be developed because faculty behavior is affected by a diversity of factors (graduate program experience, academic discipline, work environment, and personal factors). Cooper and Hensley (1993a, 1993b) established that faculty performance varied from one institution to another, and from discipline to discipline, therefore, productivity measured only by number of publications offers a very narrow view of faculty work. Broader measures of productivity must be considered rather than focusing on a single channel that tends to mask the real characteristics of academic work. Baldwin (1985) claims that faculty productivity, as measured by number of research publications, tends to devalue the many

activities that faculty engage in, and argues that productivity is also affected by personal attributes, environmental conditions, and organizational governance.

Jalongo (1985) argues that faculty productivity is measured by research publications simply because publications are easier to measure than classroom activities. In contrast, Ramsden (1994), argues that quantitative measures of productivity in terms of number of publications presents problems because it is difficult to estimate the number of publications, the mode of publishing, and the way information was collected.

To this point, the literature review has focused on definitions of productivity, traditional measurements of faculty productivity, measures of content and quality, and qualitative measures of faculty productivity. The present research also suggested a need to examine environmental and personal factors that affect faculty productivity. Such factors include resources, age of scholars, institutional contexts, and reward structures.

Environmental and Personal Factors Associated to Faculty Productivity

Resources

Research on organizational behavior has identified institutional and individual factors that affect worker behavior (Burke, 1992). Kanter (1979) points out that environmental conditions like opportunities for growth and advancement determine the amount of time, effort and motivation employees devote to their work.

Research in IHEs has examined the relationship between faculty behavior and working conditions (Crane, 1965; Birnbaum, 1991, 1992; Rebne, 1990). Schuster (1990)

argues that faculty are the core of the educational process, and that they cannot perform without adequate support for their activities. Therefore, the quality of the educational process depends on the quality and commitment of the faculty. Baldwin (1990) establishes that for universities to maintain productive faculty, the powerful forces that affect faculty behavior must be considered. Bowen and Schuster (1986) describe universities that are facing a period of deteriorating working conditions, reduced compensation, low morale, and inadequate reward systems for faculty.

Faculty productivity has been related to the appropriateness and availability of resources to support the different activities that characterize academic work (Baker, 1991; Birnbaum, 1991, 1992; Bowen & Schuster, 1986; Gallagher, 1986; Harder, 1981; Jalongo, 1985; Wood, 1990). A number of investigations have been conducted to determine the influence of working environment on faculty productivity (Creswell, 1985a; Reskin, 1977; Wood, 1990). Pelz and Andrews (1966) studied factors which account for some of the differences in faculty performance and established that differences in output measures were attributable to the type of setting. Reskin (1977), examined the links between chemists' predoctoral training, early productivity, professional recognition, and organizational context and productivity at the end of the first postdoctoral decade. He found that organizational context is an important factor in facilitating faculty productivity.

Faculty productivity also has been related to opportunity for self-development. Opportunity for renewal through challenging work assignments was important in facilitating faculty work (Baker, 1991). While the opportunity for career development has

been an important strategy in promoting faculty productivity (Baldwin, 1990; Harder, 1981; Kanter, 1979; Schmits & Bland, 1990), the availability of resources also has been employed to explain differences in productivity (Birnbaum, 1991; Harder, 1981; Wood, 1990).

The availability of funds influences faculty productivity. Many academics are forced to undertake simpler, less challenging, and more short-term research projects due to the inadequacy of funding (Wood, 1990). Resources like research assistance, computers, and secretarial support are important factors that enable faculty to carry out their work (Baldwin, 1990; Birnbaum, 1991; Cameron & Blackburn, 1981; Wood, 1990). Baldwin (1990) found that faculty cited environmental factors (e.g., funds to purchase equipment, reduced course loads, public recognition) as elements that promote or constrain their work. Faculty reported that their productivity depends on the availability of microcomputers, instructional equipment, instructional space, updated facilities, and support personnel (Birnbaum, 1992).

Another factor cited as promoting faculty productivity is sponsorship of research. Reskin (1977) found that sponsorship is a very important factor influencing faculty work. Cameron and Blackburn (1981), in a study of 250 faculty members at nine universities, found that faculty considered work on sponsored research highly related to outcome measures (e.g., publication rates, grants received, collaboration, and professional networks).

Just as sponsorship is an important factor affecting productivity, so is release time. Release time to conduct research is an important factor affecting productivity (Allison & Stewart, 1974; Harder, 1981) While time for research has been employed as a predictor of faculty productivity, the amount of time does not need to be excessive (Creswell, 1985a). Pelz and Andrews (1986) argued that too much, or too little, time dedicated to research can jeopardize faculty productivity. Faculty productivity is also affected by freedom to conduct work. Organizational freedom leads to higher levels of publication among scientists (Fox, 1983a).

The principle of “freedom of inquiry” has been considered an essential component of faculty productivity (Baldwin, 1990; Fox, 1983a; Wood, 1990). Faculty stress that autonomy in selecting research topics is essential to work success (Wood, 1990).

Age of Scholars

Complex measurement and other methodological problems make the study of the relationship between age and productivity difficult. Some researchers study this relationship considering chronological age (Cole, 1979a; Bayer & Dutton, 1977; Fulton & Trow, 1974; Pelt & Andrews, 1966), while others use years since receiving the doctorate as the standard measure (Allison & Stewart, 1974; Bayer and Dutton, 1977) or combine age with recognition and reward (Cole, 1979a).

There is a common belief that age is negatively related to productivity and creativity (Cole, 1979a). Based on an analysis of citations, Lehman (1953) was one of the

first scholars who argued that scientists are most likely to produce research of the highest quality before they reach the age of 40. He examined the proportion of discoveries made by scientists at different ages instead of considering the proportion of scientists at different ages who made important contributions (Cole, 1979a). Fulton and Trow (1974) found that older faculty spend more time and energy on teaching, at the expense of research. They also reported that there is not a substantial difference in publication rates by age after the age of 30, and only a slight decline in publication rates among those over 60. Soldofsky (1984), studying the relationship between productivity and age, grouped faculty between 26 and 61 years old and found that publishing productivity reached its peak at 0.92 articles per year for authors in the 36 to 40 year old group and declined to 0.47 articles per year for those in the 56 to 60 year old group. Rebne (1990) identified eight independent variables as predictors of productivity and found that age had a significant negative effect on productivity in all groups studied except in Biological Sciences and Education.

While these results show a negative relationship between age and productivity, Allison and Stewart (1974) corroborated the hypothesis that productivity among scientists becomes more diverse with the passage of time. The results suggested that a cumulative advantage, and preexisting differences, contributed to publication inequality by the end of scientists' careers. However, they suggested that there are more young scientists than old scientists at any point in time, so the relative contribution of cumulative advantage is limited.

Cole (1979a) studied a cross-section of scientists in six different fields and found a slight curvilinear relationship between age and quality and quantity of scientific productivity. He rejected, at least tentatively, that age is a factor that constrains productivity and that productivity declines after age 35. He argued instead, that age had very little influence on quality and quantity of productive work.

Pelz and Andrews (1966) found a dual curvilinear relationship between age and productivity; an early rise, followed by a fall, and then another increase during the fifties. Blackburn, Behymer, and Hall (1978) also reported a decline in faculty productivity at the associate professor stage and a subsequent increase in productivity at the full professor stage.

Bayer and Dutton (1977) reported a decline in faculty productivity according to career stage, with article publication peaking at approximately five to ten years into the career. They found only a slight decline of faculty productivity during the later career years, but a notable increase in the number of faculty who were not producing scholarly work.

Research on the relationship between faculty productivity and age yields conflicting results. Some studies found that faculty productivity improves with experience (Knorr, Mittermeir, Aichholzer & Waller, 1979), while others found that aging impairs faculty productivity (Cole, 1979a). Several factors can affect the relationship between faculty productivity and age, including professional recognition and the reward system (Cole, 1979a; Allison & Stewart, 1974). Age has been found to be an insignificant

correlate of faculty productivity when research performance was regressed on gender, academic rank, and the research standing of the employing institution (Over, 1982).

Blackburn, Behymer and Hall (1978) found that age and productivity are highly correlated with academic rank.

Institutional Contexts

Studies of the effects of organizational context on faculty productivity indicate that factors such as organizational structure, research orientation, administrative rules and procedures, salaries and position, and organizational prestige are related to faculty productivity (Baldwin, 1990; Birnbaum, 1991; Wood, 1990).

Among the organizational characteristics related to productivity is prestige of the institution. Prestige of institution has been related to the number of talented graduate students. As these graduate students are trained by eminent teachers, productivity tends to be high (Crane, 1965).

The employing institution can also mold individual commitment to work. It has been found that faculty work not only varies according to the type of institution, but also between highly selective and less selective institutions. Therefore, comparisons of faculty productivity of individual faculty at different institutions, as well as the use of uniform standards to determine faculty productivity require weightings that are not easy to establish (Blackburn, 1974; Fulton and Trow, 1974).

Long (1978) reported that faculty productivity was determined by the context of a new employing institution. While scientific productivity did not affect the academic rank obtained, the prestige of the institution did affect the scholar's subsequent productivity. Those faculty working in prestigious universities increased their productivity independent of their previous performance. Long and McGinnis (1981) also reported that faculty productivity is related to organizational context. Opportunity for employment in a particular organization was not strongly related to previous research activities.

The relationship between prestige of institution and productivity is unclear in the literature. While some studies have reported that prestigious institutions tend to select faculty who appear to be potential producers (Crane, 1965; Fox, 1983a; Long, 1978), Clement and Sturgis (1974) found a weak relationship between prestige of doctoral granting institution and publication output. Quality of the departments as an independent variable accounted for only 10% of the variation in productivity.

Reward Structures

Another factor influencing faculty productivity is reward structure.

Appropriate reward systems are perceived by people as ways that decision-makers assess the value of workers' activities and efforts. It is a way of encouraging members to pursue activities that lead to achievement of organizational goals. Therefore, incentive structures must be carefully constructed in order to support the goals of the institution (Levin, 1991).

Katz and Kahn (1978) identified a distinction between the reward earned through individual effort and performance, and the reward that is given to people by virtue of being

members of the organization. The former values individuals and motivates people to meet, or exceed, the established standards of the organization both in quality and quantity. A well administrated system of individual rewards can lead to increased productivity. The system reward, shared by all members of the organization, does not motivate people to increase productivity or exceed organizational standards. Therefore, reward incentives must be perceived as large enough to justify the additional efforts of workers, closely related to performance, equitable, and supportive of the goals and objectives of the institution (Katz & Kahn, 1978; Levin, 1991).

Given the importance of higher education in creating, organizing and disseminating knowledge, pressure on these institutions to reach their full potential has increased in recent years. University administrators have reacted to this pressure by focusing their attention on increasing faculty productivity through reward systems (Gunn, 1989).

The literature on faculty effort, productivity, evaluation, and compensation has been expanded to reflect the economic and social concerns of IHEs to support and motivate faculty to improve their work. Studies reveal that productivity and salary structure need to be included in the evaluation of faculty performance (Bresler, 1968; Gunn, 1989; Hoyt, 1974; Johnson & Tuckman, 1985; Kasten, 1984; Katz, 1973; Levin, 1991; Marsh & Dillon, 1980; Rossman, 1976; Salthouse, Mckeachie & Lin, 1978; Siegfried & White, 1973; Tuckman & Hagemann, 1976). However, evaluating and rewarding university professors have always been challenging tasks for administrators because it is difficult to obtain sound data on faculty activities (Katz, 1973).

One of the main problems among IHEs is that the nature of the reward structure is generally linked to the type of institution. Despite administrators' arguments that achievement will bring rewards, incentive programs are designed to value certain activities over others. Many incentive programs value research, and outstanding teaching does not earn the same recognition (Kasten, 1984; Katz, 1973; Johnson & Tuckman, 1985; Levin, 1991; Rossman, 1976; Tuckman, Gapinski & Hagemann, 1977). To overvalue one activity to the detriment of another tends to affect faculty work. Many institutions presume homogeneity across a variety of faculty activities. However, this presumption has been widely contested by researchers who have suggested that faculty commitment, involvement, and ability in research, teaching, and service vary among university departments.

At the same time, faculty performance has also been found to vary among disciplines and according to type of institutions therefore, disciplines and types of institutions differ in procedures used to make promotion and salary decisions (Bayer & Dulton, 1977). Evaluation and reward systems must consider the differences that characterize faculty work (Biglan, 1973a; Creswell & Bean, 1981; Creswell & Rosken, 1981; Lodahl and Gordon, 1972; Muffo & Langston, 1981; Rosken, 1983; Smart & Elton, 1975; 1976; 1982; Smart & McLaughlin, 1978).

In IHEs, increasing productivity through reward structures has been related to promotion, recognition, and merit pay. Siegfried and White (1973), studying the relationship between measures of productivity and salary levels in a large public university,

found that the relationship between salary and independent measures of faculty productivity (e.g., experience, research output, teaching productivity, and administrative duties) was statistically significant. Salaries varied according to the type of journals in which faculty published their works.

Others scholars have examined the relationship among research, teaching, and salary. Hoyt (1974) hypothesized that research activities detracted faculty from teaching activities because of the incentives inherent in reward systems. He conducted a study on the relationship among teaching effectiveness, scholarly productivity, and salary. He found that teaching effectiveness and publication rating were unrelated to each other. However, faculty members with substantial rates of publication received more monetary rewards than those with less impressive records. Teaching effectiveness, in turn, was found to be related to monetary rewards, but the relation was minimal. Another study found that the correlation between scholarly productivity and salary was extremely high (Rossman, 1976). Publication rate also significantly correlated with possession of a Ph.D., but only modestly related to sex and teaching effectiveness.

Tuckman and Hagemann (1976) assumed that there were salary differences among faculty in different disciplines, and that in some situations these differences could be related to the skills and attributes of faculty. They conducted a study to examine the differences in rewards between published and unpublished colleagues, and found independent variables related to faculty skills explained 64% of the variance in salary levels of faculty in economics, while the same independent variables explained only 43%

of the variance in salary differences among faculty in education. Larger salary increments were awarded to those who were considered heavier publishers in both disciplines.

Faculty productivity has also been related to supplemental income. Marsh and Dillon (1980) described the amount, and sources, of supplemental income among faculty and their relationship with academic productivity. They found that 85% of the participants reported some supplemental income. When asked about the main source of supplemental income, the most frequent responses were teaching activities, supplemental research salaries, royalties, and lecture fees. In terms of the relationship between salary and productivity, research activities (particularly the number of articles published) were substantially related to base salary and supplemental income. Teaching activities were negatively correlated with base salary, amount of supplemental income, and sources of supplemental income.

Faculty productivity has been studied in terms of its importance in promotion decisions. Kasten (1984) examined the values faculty place on research, teaching, and service when making promotion and merit pay decisions. He found that research affected tenure recommendations more strongly than teaching. Faculty reported that research activities were more important than teaching when tenure decisions had to be made. Teaching activities were important in tenure decisions only when the research reputation of the professor was adequate but not outstanding. Salthouse, Mckeachie and Lin (1978) studied the extent to which the information provided about a candidate's teaching ability would affect the promotion decision. The results revealed that both research ability and

teaching ability significantly affected the judgment about promotion, however, student ratings of candidates had a relatively small effect on judgment about promotion and salary decisions.

Student ratings as related to faculty publication have also been studied. No relationships between student evaluations, department head judgments, and publication rates were reported (Hayes, 1971; Rossman, 1976; Voeks, 1962). However, Bresler (1968) reported that faculty holding research grants were rated more favorably by students than their non-researching colleagues. One explanation for these differences might be found in the difference among types of institutions (Hayes, 1971).

The literature reviewed in this section has dealt with some of the factors commonly identified by researchers as affecting faculty productivity. Institutional and individual factors related to working conditions, financial and other resources, sponsorship, available time, and self-renewal programs were included in this discussion. Different approaches related to faculty age, institutional characteristics, and reward structures were also presented. The results reported are contradictory, and more research on factors that promote or prohibit faculty productivity is warranted.

The final body of work that relates to the present research focuses on modes that identify differences among academic disciplines. It is reasonable to suggest that if disciplines vary according to certain characteristics, faculty productivity among those disciplines will vary accordingly. To this end, it was necessary to examine differences among academic disciplines.

Cultural Differences Among Academic Disciplines and the Biglan Model

Just as faculty activities vary by type of institution, so their activities vary by academic field. Many campuses apply university-wide standards to evaluate faculty productivity without considering that faculty in universities are grouped into different academic departments with specific orientations, cultures, and values that distinguish them (Rosken, 1983).

One of the first scholars who wrote about cultural differences among faculty was Snow (1959). He established differences between scientists and literary intellectuals. Scientists, in general, share a culture different from non-scientists. Scientists share common attitudes, standards, patterns of behavior, approaches and assumptions that shape their work. In contrast, literary intellectuals behave and move in society under a different set of values and assumptions. The result is that, frequently, neither group understands the other.

A second conceptualization of faculty differences was posited by Clark (1963), who established categories among faculty. Faculty were categorized as either cosmopolitan or local, concerned with either applied or pure science, and involved in either scientific or humanistic subjects. Cosmopolitan faculty were those more closely associated with colleagues in the same discipline at other institutions, while locals were more concerned with other faculty at the same institution. Applied scientists were those concerned with practical adaptations of research, while pure scientists were more

concerned with theory-building. Scientific faculty dealt with materials and ideas, while humanistic faculty dealt with people and their problems.

Khun (1970) suggested that scholars could be grouped according to the degree of consensus about theory, methods, and problems. He argued that the physical sciences are characterized by the existence of a single paradigm that provides a single structure, specific problems for study, and methods to be used. While some subject areas are in a pre-paradigmatic stage, where there is little consensus about problems to study and methods to use, other subject areas are in a paradigmatic stage where procedures and content of research are clearly understood by the scientific community.

Lodahl and Gordon (1972) conducted a study based on Khun's model to demonstrate some of the differences among scientific fields in the functioning of graduate departments, where they assumed that teaching, research activities, and the technology determined by the structure of knowledge interacted closely. They hypothesized that there are differences among disciplines in the way that teaching, research and student relationships are conducted. They found that high-paradigm fields (physical science and chemistry) correlated in attitudes and activity levels that differed in many ways from low-paradigm fields (sociology and political science). High-paradigm fields were found to operate at levels of predictability permitted by the structure of the knowledge within the field. Low-paradigm fields were found to work at less predictable levels, and in a more anxious environment than high-paradigm fields. Because of a lack of consensus, social

scientists have difficulty in agreeing on course contents and degree requirements, resulting in a relatively unpredictable environment with high levels of conflict.

A more recent study, which has had a great impact on the study of disciplinary differences, is Biglan's work. Based on Khun (1970), Biglan (1973a) conducted research based on two main assumptions. First, academic departments within universities have distinct methods of organizing teaching, research and administrative activities. Second, the way in which subject matter is characterized may require distinct forms of department organization, a phenomenon that had not been explored previously.

Biglan (1973a) identified three dimensions of disciplines. The first dimension distinguishes hard versus soft disciplines. Hard fields are those that have a high level of consensus about paradigm, such as the physical sciences and engineering. Soft fields have a low level of consensus about paradigm, like humanities and education.

The second dimension identified pure versus applied disciplines. Applied fields are concerned with practical application of theory to problems, and include fields such as accounting, finance, and engineering. Pure fields are concerned with theory building, such as physical sciences, mathematics, social sciences, history, and philosophy.

The third dimension identified life versus non-life fields. Life fields are concerned with the study of living organisms, such as agricultural science, biological science, social science, and education. Non-life fields like geology, physics, English, and chemistry, focus on materials and other elements.

Biglan concluded that academic areas differ according to: the existence of a single paradigm, the concern with practical problems, and the concern with life systems.

In related research, Biglan (1973b) went on to study 35 academic departments for differences in two main areas. First, he examined the extent to which social connectedness varied among the academic areas. Second, he explored whether social connectedness was positively associated with scholarly productivity. Biglan reported that the structure and output of university departments are related to three characteristics of academic subject matter. A high-level of consensus about theory and methods (hard sciences) appears to determine certain forms of organizational structure. Hard areas report greater social connectedness in teaching and research activities than soft areas. Hard areas reported less commitment to teaching, greater commitment to research, more inclination to produce journal articles and technical reports, and fewer monograph publications than soft areas. Applied areas revealed a different organizational structure, and reported greater social connectedness in teaching, greater commitment to service activities, and higher rates of technical publications than pure areas. Finally, life system departments functioned as a group in training graduate students, but evidenced smaller commitment to teaching than non-life systems. Life systems did not differ significantly from non-life systems on measures of scholarly output. Those areas with a high level of paradigm development presented a structure and output characteristics that were not possible in areas with low levels of paradigm development.

Since Biglan's work was first published, many researchers have tested his model. Smart and Elton (1975; 1976) conducted studies to determine the extent to which academic departments representing Biglan's eight dimensions place different emphasis on specific goals and administrative roles of department chairmen. They found that differences among academic departments were consistent with Biglan's dimensions.

Smart and McLaughlin (1978), using the eight discipline clusters of Biglan's model and 11 categories of professional responsibility, reported the specific differences in the salary reward structure within academic settings. Their results suggested that the use of a single institutional reward structure is not advisable since it is critical to consider the different orientations of subject matter areas.

Muffo and Langston (1981) tested the validity of Biglan's model by studying whether different departments varied in average salaries, departmental size, number of students taught, and average teaching load. They found differences in average salaries by academic rank in different departments, as well as variations in departmental size and teaching loads.

Creswell and Bean (1981) conducted a study using measures of research outputs, and examined the effects of socialization as an explanation for differences identified in the Biglan model. They found that the three dimensions (hard-soft, pure-applied, and life-non-life) could be used to distinguish faculty groups in terms of publication rates. While differences in research output measures distinguished faculty groups, socialization as an explanation for differences among academic disciplines was found only in one group

(psychology, anthropology, political science, and sociology). For the remaining groups, socialization measures did not make a difference.

Smart and Elton (1982) conducted a study considering a broader set of research measures (71 variables grouped in five main categories) and a more heterogeneous institutional sample of faculty respondents. The results provided strong support for the validity of Biglan's model, and three statistically significant discriminant functions emerged. It seems clear that there are differences in cultures and degrees of development among academic departments. Each subject area has specific orientations that guides its activities.

Biglan's model might be employed to investigate faculty concerns about measures of productivity. The model suggests that faculty productivity based on university-wide standards would not reveal the fundamental differences among academic departments in their commitment to teaching, research, and service activities. In evaluating faculty work, such differences among the many activities in which they are engaged must be considered. As Biglan (1973b) notes:

In sum, it appears that any attempt at universal standards for academia will impose a uniformity of activity and output which is inconsistent with the particular subject matter requirements of specific areas, (p.213)

In conclusion, the literature on productivity in general, and productivity in the academy, has been conceptualized through six categories. First, definitions of productivity

in general were presented, and revealed that no single definition has gained universal acceptance. Rather, productivity has been described in several very distinct manners.

Second, the literature on traditional measures of productivity in academe was reviewed. Results revealed numerous interpretations of the term, various applications of those measures, and contradictory results.

Third, measures of content and quality of faculty productivity were explored. While the research suggests citation analysis and peer review are ways to measure quality of faculty productivity and departmental prestige, other measures could also be developed.

Fourth, qualitative measures of faculty productivity were examined. It seems there are discrepancies between what academic administrators value and reward and what faculty value in their work.

Fifth, factors associated with faculty productivity were discussed. Characteristics of faculty (age, experience, recognition) and academic environments (support, resources, reward structures) have been employed to examine faculty productivity, but the results are contradictory.

Sixth, research examining differences among academic disciplines was reviewed, and suggested that disciplinary differences do exist, and might serve as a basis to examine differences in faculty productivity.

Finally, it is interesting to note that the majority of research on faculty productivity has employed quantitative measures, and has examined how faculty productivity is

currently measured. Research on how faculty view the shifts in teaching, research, and service activities and how they would like to be rewarded for such activities is limited.

The present research is designed to address this gap in the existing literature. The study explores perceptions of how teaching, research, and service activities are valued and recognized in different academic disciplines. It employs qualitative techniques to examine how teaching, research, and service activities of faculty have changed in recent years and how the reward and recognition structure reflects, or does not reflect, those changes.

CHAPTER III

METHODOLOGY

The purpose of this study was to examine how teaching, research, and service activities of faculty have changed in recent years, and how the reward structure has, or has not been adjusted to reflect those changes. Specifically, this study was designed to address six broad questions.

In terms of faculty perceptions about teaching, research, and service:

1. What teaching, research and service activities are faculty currently engaged in?
2. How have these activities changed in recent years and how these changes shifted attention among teaching, research, and service?
3. How do faculty perceive future trends in terms of these changes?

In terms of faculty perceptions about recognition and rewards among teaching, research and service activities:

4. In what ways are these activities currently recognized and rewarded?
5. Have recognition and rewards changed in recent years?
6. In what ways should these activities be recognized and rewarded in the future?

Characteristics of the Setting

The study was conducted at a large, land grant university in a rural area of a southeastern state. This university is comprised of approximately 80 academic departments distributed across nine colleges. The university enrolls 23,674 students, of

whom 19,496 were undergraduate students, 3,861 were graduate students, and 317 were professional students in the fall of 1995. The campus employed 1,424 full-time instructional faculty, of whom 607 were professors, 514 were associate professors, 225 were assistant professors, and 78 were instructors. There were 1,150 other faculty and research associates, and 2,959 support staff employed by the institution.

The university offers four-year degree programs leading to the Bachelor of Arts or Bachelor of Science degree, and five-year programs leading to the Bachelor of Architecture, Bachelor of Fine Arts, and Bachelor of Landscape Architecture degrees. Sixty-three (63) fields of study lead to master's degrees, and 51 programs leading to the doctoral degree are also offered.

Sample Selection

The data used to select the sample for this study were obtained from the Institutional Research Office, which provided a list of all departments, a list of all faculty members in those departments, and a list of tenured professors in each department.

The general population for this study included all tenured (assistant, associate, and full professors) faculty from selected departments at the institution. The target sample for the study consisted of 10 faculty from four selected departments on campus.

Two steps were taken to select the sample. First, the departments were grouped according to the Biglan model (1973a, 1973b). Research has shown that academic departments differ in terms of paradigms, research modes, and pedagogy, among other factors (Snow, 1959; Clark, 1963; Rosken, 1983; Khun, 1970; Lodahl & Gordon, 1972).

One model for classifying academic departments was conceptualized by Biglan (1973a). Biglan identified three dimensions along which he rated 35 academic departments. The hard versus soft dimension measured the differences among departments characterized by either adherence to a single paradigm, hence greater consensus about content and research methods (hard), or lack of a defined research paradigm (soft). The pure versus applied dimension measured differences between a research focus on theory building (pure) and a research focus on problem solving (applied). The life versus non-life dimension measured differences between departments that focus on living organisms (life) and those that focus on other materials (non-life) (Biglan, 1973a).

Since Biglan's model was introduced, many studies have employed this framework to test its validity with respect to a variety of factors, including research modes (Smart & Elton, 1982), productivity (Creswell & Bean, 1981), salaries (Muffo & Langston, 1981; Smart & McLaughlin, 1978), and pedagogy (Smart & Elton, 1975, 1976). Collectively, the studies have consistently supported the validity of two of the three dimensions, hard versus soft, and pure versus applied. The third dimension (life versus non-life) has not been as strongly supported.

The present research employed a modified version of the Biglan model as a sampling framework to explore how teaching, research, and service varied among departments, how these activities have shifted in recent years, how faculty are recognized and rewarded for engaging in different activities, and how they would like to be rewarded in the future.

Biglan's original model classified 35 academic departments into eight clusters: hard-pure-non-life; hard-pure-life; hard-applied-non-life; hard-applied-life; soft-pure-non-life; soft-pure-life; soft-applied-non-life; soft applied-life. In the present study, only the dimensions of hard versus soft and pure versus applied were used, since these dimensions have been more thoroughly supported in previous research (Smart & Elton, 1975, 1976; Muffo & Langston, 1981; Smart & McLaughlin, 1978; Creswell & Bean, 1981; Smart & Elton, 1982).

This design rendered four clusters of departments: hard-pure, hard-applied, soft-pure, and soft-applied. The researcher then identified which of the 35 academic departments included in Biglan's original research were represented on the campus under study. These academic departments were assigned to one of the four clusters. The number of faculty in each remaining department was then identified. Table 1 reports the departments in each Biglan cluster, and the number of faculty in each department at the institution under study. One department from each cluster was purposefully selected for study (N= 4 departments). From the hard-pure cluster, Mathematics was selected. From the soft-pure cluster, English was selected. From the hard-applied cluster, Computer Science was selected, and from the soft-applied cluster, Accounting was selected. The rationale for the selection of those department was based on the fact that those department are considered to have a significant impact on undergraduate students. A great majority of

Table 1

Clustering of Academic Departments by Biglan Criteria and Number of Faculty per Department

	Hard	Soft
Pure	Chemistry (31) Entomology (14) Geology (19) Mathematics (81) Biochemistry and Anaerobic Microbiology (19) Plant Pathology, Physiology and Weed Science (21) Physics(30)	Communication (15) English (66) History (25) Philosophy (9) Political Science (12) Psychology (23) Sociology(16)
Applied	Agriculture Economics (21) Computer Science (21) Civil Engineering (38) Crop and Soil Environmental Science (26) Dairy Science(14) Mechanical Engineering (39)	Accounting (23) Economics (18) Educational Leadership and Policy study (36) Finance (19) Teaching and Learning (42)

students take classes in one or more of these departments either to meet general education requirements or to meet specific requirements for their degree programs. Therefore, it was important to explore to what extent those departments are implementing changes, using new instructional technologies producing changes in the teaching, research and service activities. The researcher also believed that examining a single department from each cluster would render broader and deeper information about the culture of those departments and the related academic discipline.

In selecting a single department, the researcher was able to compare one academic department in one Biglan cluster with academic departments in each of the other clusters. This sampling technique also maximized the utility of the results to the institution under study.

In the second step of sample selection, 10 tenured faculty from each of the four departments under study were randomly selected to interview, resulting in a total sample of 40 faculty. The sample selection was limited to tenured faculty because it was assumed that faculty who had earned tenure were more likely to talk freely about the reward and recognition structure, and rules and procedures at the institution. It was assumed tenured faculty would be more willing to critique the current reward system since doing so would not risk continued employment. In contrast, untenured faculty might feel less comfortable criticizing institutional standards regarding reward and recognition systems. Additionally, untenured faculty could be considered strivers whose teaching, research, and service activities are focused on earning tenure rather than on linking the reward structure to

those activities. For these reasons, only tenured faculty were considered for inclusion in the sample.

Procedures

The in-depth interview was selected as the data collection technique for this study because the researcher was interested in retrieving detailed and personal information about the phenomenon under study. The researcher sought to capture and understand faculty experiences and opinions about teaching, research, and service, and how these activities have been rewarded and recognized. The interview provided a framework within which participants could express their ideas, opinions, and perceptions (Patton, 1980; Stage, 1992). Interviews allowed greater flexibility in eliciting information that revealed complex situations, perceptions, and experiences of the participants' lives (Ely, Anzul, Friedman, Garner & Steinmetz, 1991; Patton, 1980; Richardson, 1983).

Several steps were undertaken to collect data. First, approval from the Institutional Review Board for Research Involving Human Subjects (IRB) was obtained.

Second, interviews were conducted with the chairpersons of the selected departments. It was assumed that the department heads could offer valuable information about the characteristics of their departments. For example, the researcher wanted to know if the departments under study were involved in reorganization processes, program changes, innovative instructional techniques, innovative community service, or important research projects. Information related to changes in the field and the culture of the

department was necessary in order for the researcher to interpret in an appropriate context what faculty had to say about their experiences.

Third, letters introducing the researcher and describing the purpose of the study were sent to all selected faculty. The letter explained to faculty that they were randomly selected to participate in the study, assured them that their individual responses would be kept confidential, explained the potential benefits of the research for faculty as well as institutional administrators, and asked them to participate. The letter also requested the respondents' permission to audio-tape the interview and transcribe responses to ensure reliability of the results (Appendix A).

Fourth, department heads were asked to communicate with their faculty about the study and its importance to the institution as a way to encourage them to participate in the study.

Fifth, a follow-up call was made to all potential respondents several days after the letters were mailed. During calls, the researcher asked faculty if they had received the initial mailing, and reminded them how important their participation was for the study. In addition, the researcher asked them if they would be willing to participate in the research, and, if so, scheduled a time for the interview. The researcher allowed the participants to select the date, time and place of the interview, to ensure that respondents felt as comfortable as possible. If a selected faculty member declined to participate, another tenured faculty member from that department was randomly selected and sent a letter.

This process was repeated until 10 faculty from four of the selected departments agreed to participate.

Sixth, the interviews were conducted. The researcher began the interviews by introducing herself and explaining the purpose and the importance of the study. Before beginning to tape the conversation, the researcher asked respondents if they had any particular concerns about the research. The participants were asked to sign an informed consent form (Appendix B). These measures were taken to establish a trusting environment that facilitated the interview process and faculty members' willingness to talk about their personal opinions and perceptions.

The researcher was interested in exploring faculty perceptions regarding teaching, research, and service activities, and in what ways these activities have been rewarded and recognized. Therefore, the interview was based on semi-structured, open-ended questions focused around the particular topic under study. The questions were asked in a systematic order that the researcher considered appropriate. However, the researcher allowed the respondents sufficient freedom to jump from one idea to another, if they so desired.

The participants were encouraged to fully respond to the prepared questions. However, prompt questions were included in the interview protocol to allow the researcher to guide the general direction of the dialogue. The researcher encouraged the respondents to talk about how they spent their time with respect to teaching, research, and service activities and how they were recognized and rewarded for their activities. At

the same time, the participants were told that if any idea generated during the conversation was uncomfortable for them, they were free to stop the tape at any time.

In addition to the interviews, written notes were taken to guide the researcher in the data analysis process.

Interview Protocol

An interview protocol was designed to elicit data about the respondents and the research questions. The protocol consisted of two sections. The first section gathered demographic data about the respondents, including academic rank, age, sex, and years of experience on faculty. The second section sought information about the six research questions.

To elicit data about teaching, research and service, faculty were asked to characterize these activities and how they have changed in recent years. For example, respondents were asked if there had been changes in class size, teaching load, advising responsibilities, or the use of technology in instructional activities. They were asked to describe major sources that prompted the changes (e.g., Department Head, Dean, Provost, professional association, or external constituencies), and, how these sources had affected their work.

Data about recognition and reward structures were gathered by asking faculty in what ways teaching, research, and service had been recognized and rewarded in the past, and how recognition and rewards had changed in recent years. Additionally, faculty were asked how they would like to be recognized and rewarded for their efforts in the future,

and what their departments could be doing to better recognize teaching, research, and service activities.

Interviews were conducted between March 10 and April 25, 1996. Each interview lasted 60-90 minutes, and took place at a date, time, and location selected by the respondent.

Data collection and analysis occurred simultaneously. As themes emerged in the first few interviews, the interview protocol was amended to ask about those themes in subsequent interviews. The research questions, and interview questions related to them are summarized in Table 2. The complete interview protocol, including prompt questions, appears in Appendix C.

Results

Audio tapes of the interviews were transcribed by the researcher and a paid transcriber. All identifying information was erased from the tapes prior to giving them to the paid assistant. The transcriptions were compared to the audio tapes to ensure accuracy.

Analysis followed qualitative research procedures. The data analysis process included several steps. First, the researcher read the transcribed interviews several times, trying to identify similarities and differences among the respondents. Second, the transcriptions were compared with the field notes to facilitate classification of the

Table 2

Research and Interview Questions

Research Questions	Interview Questions
1. What teaching, research, and service activities are faculty currently engaged in?	How would you characterize your teaching activities?
	How would you characterize your research activities?
	How would you characterize your service activities?
2. How have those activities changed in recent years and how those changes shifted attention among teaching, research, and service?	How have your teaching activities changed in recent years?
	What prompted those changes?
	How have your research activities changed in recent years?
	What prompted those changes?
	How have your service activities changed in recent years?
	What prompted those changes?
3. How do faculty perceive the future in terms of these changes?	Considering the present conditions, what do you see as your future responsibilities in terms of teaching?
	Considering the present conditions, what do you see as your future responsibilities in terms of research?
	Considering the present conditions, what do you see as your future responsibilities in terms of service?

Table 2

Research and Interview Questions (Cont.).

Research Questions	Interview Questions
4. In what ways are teaching, research, and service currently rewarded and recognized?	In what ways is teaching valued or rewarded in your department?
	In what ways is research valued or rewarded in your department?
	In what ways is service valued or rewarded in your department?
5. Have recognition and rewards for teaching, research, and service activities changed in recent years?	How have recognition and rewards for teaching changed in recent years?
	What prompted those changes?
	How have recognition and rewards for research changes in recent years?
	What prompted those changes?
	How have recognition and rewards for service changed in recent years?
	What prompted those changes?
6. How should teaching, research, and service be rewarded and recognized in the future?	How would you like to be rewarded in the future for your teaching activities?
	How would you like to be rewarded in the future for your research activities?
	How would you like to be rewarded in the future for your service activities?

information. Third, transcripts were studied for frequently mentioned words, phrases and ideas. These words, phrases and ideas were noted on individual index cards. The index cards were then sorted into related categories and used to identify themes and dimensions within themes. The frequency with which the theme was mentioned was calculated, and the dimensions within each theme described.

The results of the data were presented in a narrative style from several perspectives. In order to place the reader in the context of the institution under study several steps were taken. First, a description of the demographic characteristics of the departments under study was presented. Second, a brief description of the sample in the study was presented. Next, the data on teaching, research, service and the reward system were reported. In all instances, the number and percentages of comments offered by faculty in each department about each theme and sub-theme were calculated and reported. Exerpts from interviews were used to illuminate all themes and subthemes that emerged from the interviews.

This design enabled the interviewer to explore how teaching, research, and service activities varied among different departments. It also provided information about how those activities had changed in recent years. Data about the ways faculty were recognized and rewarded for these activities, and how these rewards had changed in recent years were also collected. Finally, the researcher collected data about how faculty would like to be rewarded in the future for their teaching, research, and service activities.

Trustworthiness and Authenticity

To enhance the trustworthiness and authenticity of the results, the researcher took two steps. First, at the end of each interview, the researcher summarized the main ideas or topics that emerged during the interview. These summaries were recorded on a contact summary form (Appendix D). The researcher asked the participants if the summary reflected what they wanted to express. In doing this, the researcher ensured the accuracy of the information, and provided the participants an opportunity to make corrections if some misunderstanding emerged during the interview process. The summary contact form included information about relevant issues and themes that emerged during the interview process, summaries of those ideas that were frequently mentioned by the respondent, anything that the researcher considered salient, important or illuminating to the topic under study, and new prompt questions to consider in subsequent interviews.

Second, an experienced researcher reviewed the audio tapes and transcripts of the first few interviews conducted. This enabled the researcher to refine the interview protocol, and ensured that the themes and trends noted by the researcher were genuine and accurate. The combination of these two steps enhanced the trustworthiness and authenticity of the results.

Summary

This study was designed to enable the researcher to elicit data about faculty perceptions about teaching, research, and service, how those activities were valued, and how they were rewarded in different academic departments. Based on the data, the

researcher was able to draw some conclusions about how the reward structures might be adapted to more closely reflect the values of the departments under study.

CHAPTER IV

RESULTS

The purpose of this study was to examine how teaching, research, and service activities of faculty have changed in recent years, and how the reward structure has, or has not been adjusted to reflect those changes. In this chapter, the results of the interviews with faculty are reported. The results are reported in seven sections. The first two sections include descriptions of the selected departments in the study, and characteristics of the sample. The next four sections focus on the results related to the phenomena under study namely: teaching; research; service; and rewards. In the teaching, research and service sections, there are four sub-themes: current status; recent changes; sources of changes; and future trends. Additionally, a fifth theme emerged with respect to teaching: the use of technology. This merits a separate subsection in the results related to teaching. An additional theme emerged in the research section, as well: sources of funding. In the fourth section, rewards, there are 3 subsections: current status, recent changes and future trends. Tables that summarize data are provided whenever the number of themes and subthemes merits such a consolidation of information. In other instances, the limited amount of data is summarized in text.

Descriptions of the Departments

Using a modified version of Biglan model as a sampling framework, four departments were selected, one from each Biglan cluster. From the hard-pure cluster Math was selected. From the hard-applied cluster Computer Science was selected. From the

soft-pure cluster English was selected, and from the soft-applied cluster Accounting was selected. These departments may be referred to as the HP department, the HA department, the SP department and the SA department (respectively) throughout the remainder of this chapter.

Personal interviews with the heads of these four departments were conducted to gain a better understanding about changes that might have occurred in faculty activities and/or the reward structure in recent years. Additional information provided by the Institutional Research office, university graduate and undergraduate catalogs, and the department heads was reviewed to enable the researcher to develop a general understanding of the four departments before conducting interviews with faculty in those programs.

Table 3 describes the demographic characteristics of the four departments, including the total number of faculty members, the number of students enrolled by type of degree program, and the total number of credit course hours earned by the faculty in the Fall, 1995 semester.

The Hard-Pure Department: Mathematics

The Hard-Pure Department is housed in the College of Arts and Sciences, and offers curricula for math majors and for students who intend to teach secondary school mathematics. Both lead to a Bachelor of Science degree. This department also offers a Master's in Science and Ph.D. program. The department employs a total of 83 faculty members dedicated to graduate and undergraduate teaching. In the fall of 1995, this

Table 3

Demographic Characteristics of the Departments under Study

Characteristics	Math HP n	Comp.Sci. HA n	English SP n	Acct. SA n	Total N
Tenured Faculty Members					
Professor	33	8	13	8	
Associate	10	11	16	6	
Assistant	1	0	3	0	
Subtotal	44	19	32	14	109
Tenure -Track Faculty					
Associate	1	1	0	0	
Assistant	8	0	6	9	
Instructors	0	0	3	0	
Subtotal	9	1	9	9	28
Non-Tenure Faculty					
Associate	0	0	0	0	
Assistant	0	0	0	0	
Instructors	30	3	46	0	
Subtotal	30	3	46	0	79
# of Students by type of program					
Bachelor's	231	594	292	626	
Master's degree	41	109	54	61	
Ph.D.	36	39	0	14	
Subtotal	308	742	346	701	2,097
Student credit hours *					
Subtotal	31,824	8,350	19,379	10,117	69,670

* Fall of 1995

department enrolled 308 students who had selected Math as their major program. However, since nearly all students at the institution are required to complete math courses as part of their degree programs, the department teaches a large number of service courses. As a result, HP faculty taught a total of 31,824 student credit hours in the fall, 1995 semester.

According to the department head, this department has been heavily involved in curricular development activities in recent years (e.g., calculus reform), therefore, faculty have increased their level of service activity. The major changes in instructional activities are related to the use of technology to improve the effectiveness in teaching, and the expanded use of writing courses and team work as pedagogical strategies. The faculty in the department also work with high school teachers in developing new approaches to teaching mathematics.

In relation to the recognition and reward system, the department head reported that the department has a personnel committee that reviews faculty activity reports in the evaluation and promotion process. It was also noted that there is a general concern in the department that faculty vary in their inclinations, strengths, with respect to their dedication, and expertise in teaching, research, and service activities. Therefore, the department is working on implementing a new way to evaluate and reward faculty. Faculty members present to the personnel committee the percentages that they want to assign to teaching, research, and service activities. The personnel committee studies each case, and

approves or modifies the balance among the activities. At the end of the year, the faculty's evaluation is based on those percentages.

The Hard-Applied Department: Computer Science

The HA department is situated in the College of Arts and Sciences and offers both service courses directed to the needs of non-majors who will be using computers as tools in their careers, and an undergraduate program that leads to the Bachelor of Science degree. This department also offers a Master's in Science program and a Ph.D. program. This department employs a total of 23 faculty members dedicated to graduate and undergraduate teaching. In the fall of 1995, there were 742 Computer Science majors, and the faculty amassed a total of 8,350 student credit hours.

The department head reported that faculty maintain a heavy undergraduate teaching load, and they are a leading department in providing students with cooperative education opportunities. The department works in conjunction with several local public schools, helping at-risk children who are not reading at their appropriate level, and providing remedial and advanced support in math, science, and programming. Given its nature, the department is heavily involved in the use of technology to support teaching activities.

In terms of evaluating and rewarding teaching, research, and service, the department head admitted there are standard expectations which require all faculty to be involved in teaching, research and service activities. A normal balance is interpreted as 40% time spent in teaching, 40% in research, and 20% in service. The department head

also reported that the faculty have been under severe pressure in recent years to increase their time in teaching, research, and service. However, the institution has not rewarded faculty for their efforts.

Finally, he mentioned that severe cutbacks in the budget have significantly curtailed the amount of grant money to develop research programs.

The Soft-Pure Department: English

The SP department is housed in the College of Arts and Science and offers a variety of programs related to the study of languages and literature for students who are preparing for graduate or professional schools, who plan to teach, or who are seeking careers that involve the art of writing. It offers two different programs: the Bachelor of Arts, and the Master of Arts. This department employs a total of 87 faculty members, and enrolled 346 students in the fall of 1995 who had selected English as their major program of study. The English faculty, like the Math faculty, teach a large number of service courses. English faculty taught a total of 19,379 student credit hours in the fall, 1995 semester.

In an interview with the department head, he pointed out that the English department is a large department with a lot of good research going on. The majority of research is related to literary criticism, the application of technology to teaching activities, and electronic editing.

Teaching activities have increasingly used technology in the classroom, and some faculty teach courses exclusively on-line to sites all over the country.

In terms of the way that the department evaluates and rewards teaching, research, and service activities, the department head noted that even though the department carries a heavy undergraduate teaching load, the evaluation and reward system is linked most closely to research activities. The evaluation and promotion process is conducted by the department head in conjunction with the dean of the college. The balance among teaching, research, and service is generally dictated by the university's procedures that call for full-time faculty to teach four courses per year. However, he admitted that, for some faculty, the teaching load varies depending on their research activities. That is, a faculty member who spends more time in research can be assigned a lighter teaching load.

Among the changes affecting the English Department in recent years, the department head mentioned that cutbacks in budget have prevented the hiring of more faculty, and limited funds to support research programs. Finally, he pointed out that despite the extensive contribution to service made by faculty, there is no reward for service, and faculty do not merit significant raises solely on the basis of service.

The Soft-Applied Department: Accounting

The SA department is housed in the College of Business, and offers an undergraduate program designed to prepare students for careers in accounting practice that leads to the Bachelor of Science degree or to entry into a graduate accounting program. This department also offers a Master's of Science program, and a Ph.D. program. This department employs a total of 23 faculty members. In the fall of 1995, there

was a total of 701 students who had selected Accounting as their major program. Faculty taught a total of 10,117 student credit hours that semester.

The department head focused his responses during the interview on the evaluation process. He explained that faculty in this department are expected to be involved in teaching, research, and service activities. While faculty cannot be involved in only one area, they can be assigned a lighter teaching load if they are more involved in research work. Therefore, research is a strong factor in the evaluation process, and faculty would not be promoted if they were not involved in research work.

The department head also explained that the classic problem is that some faculty are better teachers, while others are stronger researchers, and the department is trying to consider those differences. However, the general expectation is that all faculty will be involved in teaching, research, and service.

Another special concern mentioned by the department head was the lack of resources to support research programs. External pressures are leading the department to be involved in more teaching, leaving fewer resources for research. Finally, he pointed out in the evaluation process decisions are based on a "moving average" as far as research is concerned. This moving average consists of reviewing published research and papers accepted over the past couple of years, and trying to project these numbers to the future. He also considers where papers are in the review process, and from that, he makes an assessment about research productivity which he uses to calculate salary increases.

In summary, all four department heads were very friendly and willing to help. They explained some of the criteria they use to evaluate individuals, but seldom provided the relative weights that are assigned to teaching, research, and service when rewarding faculty. Most of the information about the evaluation process focused on research activities. In teaching, the criterion that carried the most weight was student evaluations. The department heads acknowledge that it is easier to evaluate research than teaching activities. Research work is more measurable, hence more suitable to consider in promotion and salary decisions. A slight difference was noted in the Math Department, where teaching activities merited more attention.

It became clear that research ability, the number of publications, the quality of journal articles, the number of book reviews, and participation in international meetings were the most important factors that influenced the way the departments recognize and reward faculty.

Public service, administrative, and committee work were the other factors that the department heads mentioned. Even though all four departments expected all faculty to be involved in teaching, research, and service, service is not considered a way to earn promotion or salary increases. In fact, in English, faculty would not get a significant salary increase based on solely on service activities and clearly research is most highly valued, followed by teaching, then service.

The four department heads also agreed that faculty have varying degrees of expertise, which makes it difficult to couple the evaluation rules and procedures of the

department with faculty work. They also agreed that external pressures in recent years have demanded more accountability and productivity, while providing fewer resources to accomplish those goals.

Given this overview of the four departments under study, a description of the sample studied in the present research is merited.

Demographic Characteristics of the Sample

The sample for this research included 38 tenured faculty, employed in four academic departments, at one large, public, research university in the southeastern region of United States. Demographic data were collected from all respondents, and are summarized in Table 4.

All 38 faculty members had a Ph.D. degree. In terms of years of experience, 24% had 1 to 10 years of experience; 39% had between 11 and 20 years of experience; and 37% reported more than 20 years of experience. Ninety two percent were male and 8% were female. Forty seven percent were Professors, 50% were Associates, and 3% were Assistants.

In order to select the sample, the researcher sent letters to randomly selected faculty in each department, then followed-up with phone calls to confirm their willingness to participate. If a faculty member declined to be interviewed, another faculty was randomly selected and sent a letter. This process was repeated until 10 faculty from each department agreed to participate, or until all faculty had been invited to participate. Willingness to participate in the research varied slightly among the departments.

Table 4

Demographic Description of the Selected Sample

Characteristics	Math HP n	Comp.Sci. HA n	English SP n	Acct. SA n	Total N/%
Degree Obtained					
Ph.D.	10	9	10	9	38/100
Years of Experience at the Institution					
1-10	1	2	5	1	9/24
11-20	3	6	1	5	15/39
20+	6	1	4	3	14/37
Sex					
Female	0	1	2	0	3/8
Male	10	8	8	9	35/92
Academic Rank					
Professor	7	3	3	5	18/47
Associate	3	6	6	4	19/50
Assistant	0	0	1	0	1/3

In the HP department, six of the 10 tenured faculty originally invited to participate declined the opportunity. The invitation process was repeated. In all, 24 faculty were invited to participate before 10 agreed to do so.

In the HA department, the same procedure was used. A total of 18 letters were sent to faculty asking them to participate before 9 agreed to do so. As there were only 18 faculty in the department who met the selection criteria (e.g., tenured and willing to participate), nine was the maximum number of participants who could be interviewed.

In the SP department, a total of 18 letters were sent to faculty before 10 agreed to participate, while in SA department, letters to all 13 faculty eligible to participate yielded nine respondents.

The researcher also noted some general observations about the respondents. As a rule, respondents were willing to offer information about the questions under study, though some asked for more detailed information before agreeing to participate. Some were also concerned about the time commitment involved for participants, because the initial letter had requested 90 minutes of their time. After the first four interviews, the researcher realized that 60 minutes was a sufficient amount of time, and respondents found that a more reasonable request.

The interviews were conducted in the respondents' offices where, for the most part, the environment was quiet and comfortable. All but one respondent felt free to talk cordially. The one exception expressed some concerns about the information he had

offered when the researcher asked if he had something else to add to the interview, but the researcher reassured him about the confidentiality of his individual responses.

As the interviews progressed, the interview protocol was modified slightly, and the interview was considered exhaustive by the participants. In a few cases, the researcher wanted to clarify or elicit additional information, and contacted respondents by electronic mail or phone to seek that data. In all cases, the participants were very willing to offer more information whenever it was necessary.

Given this understanding of the department contexts, and respondents who participated in the study, attention now turns to the data collected with respect to the first of the phenomena under study, teaching.

Results Related to Teaching Activities

The results related to teaching are reported in five sections. The first four sections (current status, changes, sources of changes, future trends) relate specifically to the research questions posed in the study. The fifth section, related to the impact of technology, is an additional theme that emerged when the interview transcripts were analyzed.

Current Status in Teaching

The theme “Current Status” included all those sections of the interviews that related to how teaching was characterized and described by faculty. Analysis revealed three sub-themes: personal attitudes towards teaching; course levels; and level of involvement in teaching activities.

Personal Attitudes Towards Teaching

Faculty in all four departments were asked to describe and characterize their teaching activities. Thirty-three (87%) responses focused on the number and names of courses. For example:

I teach normally, six hours a semester and usually that's either Governmental and Not-for-Profit Accounting, which is a senior level undergraduate course, or it is Intermediate Accounting, which is a junior level undergraduate course. Probably three of the four sections I teach in a typical year will be Government and Not-for Profit (SA faculty).

Five (13%) responses were related to personal attitudes about teaching, including:

Okay. I like this job so much that I would do it for free if I were wealthy.

Ah, every now and then I'll get a class that is not very motivated, but that doesn't happen very often. Just the whole idea of having ideas and getting them across to young people I find to very fulfilling (SP faculty).

Course levels

Another way of describing teaching activities was related to the course levels. In all, 38 (100%) reported undergraduate teaching, and 26 (68%) reported graduate teaching. For example:

Well I usually, I teach, I teach both undergraduate and graduate classes, primarily, and I'm talking at the freshman level all way through to the senior level all the way up to the graduate 4000, or 5000 thousand courses (HA faculty).

Level of Involvement

Finally, responses related to level of involvement were assigned three categories according to the number of hours that faculty spent in teaching and related activities: high, medium, and low. Those comments assigned to the category of high level of involvement suggested that faculty spend more than 20 hours in teaching work per week. For example:

I would split the time between teaching, research, and service in a typical week. A typical week probably run about 55 hours and, uh, probably goes about 20,20,15. Twenty hours would be teaching, 20 hours would be research and 15 would be administration. Does that makes sense? (HA faculty).

Comments made by participants related to medium levels of involvement suggested that faculty work between 15 and 20 hours per week in teaching and related activities. For example:

Let's see, typical week I would spend, um probably, uh, let's just um, ten hours on service, I guess, whatever you call service, um, ten hours on service (pause), I guess I would say, I would say, I mean it's hard to split these things, um, I would say 15 hours on teaching, and um, I don't know, I guess I would say um, (pause), I guess something like 15 hours in research (SA faculty).

Comments made by participants related to a low level of involvement suggested that faculty work less than 15 hours per week in teaching and related activities, as the following suggests:

Uh, probably at a guess something like 40 to 50 hours of research, um, maybe 10 hours on teaching, 10 to 15 teaching, and three hours on service, something like that (HP).

Overall, there were 38 comments made by respondents with respect to level of involvement in teaching activities. Of those 29 (76%) reflected a to high level of involvement, 8 (21 %) described a medium level of involvement, and 1 (3%) reflected a low level of involvement.

Changes in Teaching Activities

The theme “Changes in Teaching” included all those sections of the interviews that described how instruction has changed for faculty in recent years. Analysis revealed three sub-themes: class size; teaching load and student advising; and four new subthemes that emerged: technology; teaching style; curricular reform; and team work. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided in Table 5.

Class Size

Comments made by participants about changes that have occurred in recent years with respect to class size were assigned to one of three levels: high degree, some degree, or low (or no) degree of change. Those comments assigned to the “high degree” category suggest that faculty had noticed a significant increase or decrease in class size in recent years. For example:

Table 5

Changes in Teaching Activities in Recent Years (by number of comments)

Characteristics	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Acct. SA n (r)	Total N/% (R)
Class Size					
High	13 (6)	8 (5)	2 (2)	0 (0)	23/46 (13)
Medium	4 (3)	0 (0)	5 (4)	3 (3)	12/24 (10)
Low	2 (2)	1 (1)	7 (5)	5 (5)	15/30 (13)
Subtotal					<u>50/13</u>
Teaching Load					
High	3 (1)	0 (0)	3 (3)	0 (0)	6/32 (4)
Medium	1 (1)	0 (0)	3 (2)	0 (0)	4/21 (3)
Low	0 (0)	0 (0)	2 (2)	7 (6)	9/47 (8)
Subtotal					<u>19/5</u>
Student Advising					
High	4 (3)	3 (3)	0 (0)	1 (1)	8/47 (7)
Medium	1 (1)	2 (1)	1 (1)	1 (1)	5/29 (4)
Low	0 (0)	1 (1)	2 (1)	1 (1)	4/24 (3)
Subtotal					<u>17/4</u>

* (R) : Number of respondents who made comments

Well, okay, all right, sure. Well the class sizes are definitely increasing. I mean, in our department, in Computer Science, we have had a double class size, the freshman level has doubled in the last two years, and the number of faculty members has remained about constant. So the class size has gone up a lot (HA faculty).

Well, yeah, we, well here, uh, right here in our department, about three years ago we reduced a lot of the class sizes uh, because uh, of the feeling that the students would do better in small classes. But uh, that's been hard, it's hard to maintain because the uh, of budgets constraints. It's very expensive to teach in small classes. I think it's important to have smaller classes, but it's getting harder and harder to do that (HP faculty).

Language assigned to the category reflecting a medium degree of change included comments that suggest more moderate changes in either direction, including:

My literature courses are down a little bit. Uh, the freshman classes have dropped just a bit. They were 20, average 27, 28 and they're around 24, 25 now. So not drastic change (SP faculty).

Comments that reflected little or no change in terms of class size included:

No, class size has not increased. Uh, but because of these, you know, it's not pure lecture, now it's more preparing cases, preparing materials (SA faculty).

Of the 50 comments respondents made about changes in class size, 46% reported a high degree of change, while 24% and 30% reported medium or low degrees of change, respectively.

Teaching Load

Comments made by participants about changes that have occurred in recent years with respect to teaching load were assigned to one of three levels: high degree, some degree, or low (or no) degree of change. Those comments assigned to the “high degree” category suggest that faculty had noticed a significant increase or decrease in teaching load in recent years. For example:

Now, my teaching load this year is four courses, but traditionally it has been three or two courses, because of cutbacks and so forth, people’s teaching loads are increasing at this point (HA faculty).

..., for me it has not changed for, oh, close to 25 years. ..., when I started, I was an instructor and the standard load was four classes. But uh, very, very soon after uh, after I finished my doctorate uh, when I was promoted to an assistant professor uh, the load dropped to three classes (SP faculty).

Language assigned to the category reflecting some degree of change included comments that suggest more moderate changes in either direction, including:

When I was half-time research and half-time teaching, I taught four courses a year.

And when my brain quit working, they added another class. So I don’t do as much

as research now, and I do more teaching. Which is good for me because I am better at it (HP faculty).

Language assigned to the category reflecting little or no change in terms of teaching load included:

Changes in my teaching load, no, it has been the same in my entire amount of time here at this university (SA faculty).

Of the 19 comments made with respect to teaching load, 32% suggested a high degree of change, 21% suggested a medium degree of change, and 47% suggested a low degree of change.

Student Advising

Comments made by participants about changes that have occurred in recent years with respect to student advising were assigned to one of three levels: high degree, some degree, or low (or no) degree of change. Those comments assigned to the “high degree” category suggest that faculty had noticed a significant increase or decrease in student advising in recent years. For example:

Yes, it changes from year to year. I was, for a long time there, I was advising undergraduates. .. now that I am advising graduates, I’m on the graduate student committee. And I’d rather when I, I was chairman of the Ph.D. committee, I advised Ph.D. students. So it depends on like, now I’m on the, I’m chairman of the master’s committee, so I advise master students. Otherwise, the, the biggest load is advising undergraduates. The freshmen and sophomore are advised downstairs in

the dean's office, and we advise juniors and seniors, on up. In that regard, my advising work has increased (SA faculty).

Advising? Ah, yeah. I am real happy with the advising. .. it used to be that we would have as many as 10 or 20 advisees, and I got so completely weary doing that, that I resigned for, you know, like five or six years as an advisor. Then, one person, [name of the person], got to be in charge of advising and he wanted us to give the students more personal attention, so that we now have 40 advisors out of 100 faculty members and we have no more than five to seven advisees. I keep in touch with them. I have had dinner with some of their parents. They come to my house. I go over their grades. If they are having a dispute with their professors, and in one case with their parents, I will intervene. So I feel like since we have a much smaller number that we are able to give them very good advising service. We have had a decrease in number, but a real increase in quality (SP faculty).

Language assigned to the category reflecting some degree of change included comments that suggest more moderate changes in either direction, including:

The advising responsibilities in our department have changed, .. in terms of time spent in advising but not so much. .. it is pretty much evenly, .. all the freshmen are advised by two people. But then once you're a sophomore, you're just assigned sort of randomly to all the faculty. So, right now I probably have 25 30 students that I advise academically (HA faculty).

Comments that reflected little or no change in terms of student advising included:

No, it's been just the same. The Math Department has one of the best advising. The Math Department has a very good advising program set up. We're probably the best on campus, what I've heard. And, .. we work well with the advising. Everybody here takes it seriously. For example, all my students come in under normal circumstances and talk to me every semester before I even let them see opscan things, and I go over their progress with them and I post notices on the door telling them what they need to be doing as of this year, what kind of stuff, requirements should be out of the way, send e-mail messages out to the advisees as a whole giving some information. I look over their progress reports that we have each semester when they come in to uh, register. And then, if I like what they're doing, I give them an opscan. Most of the time I make them fill out the program first, before I even see the opscan. I won't even let them have it until I look it over. And uh, a lot of the people in the department are that way. We don't just have a secretary give out opscan forms and pick them up and sign them the way they do in some departments. We're serious about getting our people out of here when they should get out. .. most of the time we're able to do that (HP faculty).

Of the 17 comments respondents offered about advising, 47% reported a high degree of change with respect to this activity, while 29% and 24% reported medium or low degrees of change, respectively.

In changes in teaching activities faculty also mentioned that technology innovation, teaching style, curriculum reform, and the use of team work are considered as recent changes affecting teaching activities.

Technology Innovation

Comments made by participants about changes that have occurred in recent years with respect to technology innovation all reflected a high degree of change, and all suggested a significant increase in the use of technology in teaching activities.

Well that's changed a lot also. ... a lot of the professors are using uh, at least in the Accounting Department, are using computers to use electronic spread sheets to solve problems. And also using computers to put their notes on overheads, and to provide the students with... Also, in this department some of the professors are putting, .. solutions to problems, .. and various class material on the World Wide Web, so students can look it up there (SA faculty).

In all, respondents offered 213 comments about the increased use of technology, rendering it the single most mentioned change with respect to instructional activities.

Teaching Style

Comments (N=46) made by participants about changes that have occurred in recent years with respect to teaching style all suggested a high degree of change, and indicate that faculty have noticed a significant increase in the emphasis on teaching style.

For example:

There is another trend, too, which is beginning to develop that we hope will be possible, which is the use of this idea of virtual corporation for students. A lot of times, because we are in a science and engineering area, employers like to see that students have an opportunity to participate in teams, rather than working as individuals, through school. So this desire is a real fundamental change in the way we educate students. Because normally students work independently, and they are penalized whenever they work together because they have to cheat or something on their exam or homework. And so, there are very few opportunities for students to work together as teams when they go through school, but even if they do, in a class the teacher will limit it to teams of two students, or three, or four students. So the virtual corporation idea allows a large group of students between many departments to work together on one activity. And so they would work like a corporation, just like a corporation would exist in the private sector, and it is envisioned that maybe several hundred students would work together on one project and they would receive credit for that as part of their undergraduate or graduate degree (HA faculty).

Curriculum Reform

Comments (N=22) made by participants about changes that have occurred in recent years with respect to curriculum reform all suggest a high degree of change. Faculty had noticed a significant increase in curriculum reform in recent years. For example:

Well, our department had a big curriculum reform and we moved away from surveys to intensive studies of various authors and I did what the department said, but I am not sure that was a good idea. Uh, for example, I think the worst mistake that has been made in this department in 10 years is we dropped Shakespeare and Chaucer as a requirement. He's best known for a work called The Canterbury Tales. And even though I teach American Literature, I teach a course in rock and roll, and I teach poetry, .. I still think that a student absolutely must take Shakespeare (SP faculty).

Team Work

Comments (N=32) made by participants about changes that have occurred in recent years with respect to the use of teams in teaching all suggested a significant increase in the use of this pedagogical tool. For example:

Well, I think there's a lot more emphasis on team approach to learning. ... more emphasis on that, and less emphasis on lecture. Although in my classes I've tried to, over the years, to minimize the lecture podium and get students highly involved in, in the class. The concept is that uh, students, uh, learn more if they get actively involved. It's called, really, active learning. Actively involved in learning, as opposed to a professor getting up on front and, and lecturing which is, uh, students passively involved. Now, that student can, in turn, tune a professor out. But if a student has a project to work on, and they have a, a debate to put together, uh they have to get actively involved in doing that (SA faculty).

Overall, there were 399 comments reflecting changes in teaching activities in recent years. Of those, 50 (13%) were related to class size, 19 (5%) were related to teaching load, 17 (4%) were related to student advising, 213 (54%) were related to technology innovation, 46 (12%) were related to teaching style, 22 (5%) were related to curriculum reform, and 32 (8%) were related to team work.

Sources of Change in Teaching Activities

The theme “Sources of Change” included all those sections of the interviews that described the main sources of change in teaching activities in recent years, as described by faculty. Analysis revealed three sub-themes: external sources of change, internal sources of change, and personal factors. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided on Table 6.

External Sources of Change

Comments made by participants about external forces that have impacted teaching included references to: government, business or the market, parents, and professional associations, and computer availability.

Government.

Those comments assigned to government as a source of change, suggest that government policies and decisions have affected teaching activities in recent years. For example:

Table 6

Sources of Change in Teaching Activities (by number of comments)

Characteristics	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Accounting SA n (r)	Total N/% (R)
External					
Government	20 (9)	18 (7)	9 (10)	0 (0)	57/32 (26)
Business	8 (5)	6 (3)	0 (0)	20 (7)	34/19 (15)
Parents	6 (3)	5 (4)	5 (4)	0 (0)	16/9 (11)
Prof. Assoc.	12 (7)	6 (6)	5 (4)	22 (9)	45/26 (26)
Comp. Avail.	9 (6)	4 (4)	3 (3)	8 (5)	24/42 (18)
Subtotal					176/67
Internal					
Administration	11 (6)	7 (4)	6 (6)	2 (1)	26/38 (17)
Department Head	15 (10)	6 (6)	11 (7)	10 (6)	42/62 (29)
Subtotal					68/26
Personal Factors					
Subtotal	5 (3)	4 (4)	6 (6)	4 (3)	19/100 (16)
					19/7
Total					263/100

* (R) : Number of respondents who made comments

Government? Yes, the Department of Defense, for example, they say, look you need to teach AIOA, certain programming languages and things like that. So yes, they don't differ much from business, okay, in that they have certain needs and they would like for us to accommodate those needs Now the other thing that government also does, is government pushes, pushes the edge of technology, do you know what I mean? In other words, government for example, really brought about this notion of e-mail and the internet working, all right. So, they push you to teach classes on the cutting edge, does that make sense? So if anything, government really pushes us forward in what their demands and dictates are (HA faculty).

Business.

Those comments assigned to the business sector as a source of change suggest that business policies have had an impact on teaching activities in recent years. For example:

Yeah, the demand by business has been organized. The accounting firms have organized, and have demanded changes in the accounting education system both in how it's delivered in the use of technology and, ah, and in the content (SA faculty).

Parents.

Those comments assigned to parents as a source of change, suggest that pressure from parents have influenced teaching and related activities in recent years. For example:

Parents, they pay. And they want to know. They, they, they're interested in the progress of their students. Uh, if bad things happen, parents are very, very quick to call not the professor, not the department head, not the assistant department head or the dean or the provost. They'll call the president, they'll call a friend of theirs on the Board of Visitors, they'll call their local uh, representative to the House of Delegates or the Senate. They'll call the governor. They're not shy at all (HP faculty).

Professional Associations.

Those comments assigned to professional associations as a source of change suggest that those associations have influenced teaching activities in recent years. For example:

Well, again, our professional association is called ACM (Association of Computer Machinery) and there the way they are broken up, they are broken up in disciplinary, subdiscipline areas that they call special interest groups. Uh, those all usually have an education component. Uh, the main body itself sponsors curriculum, uh suggestions. They have curriculum guidelines and the like, and there are major conferences, is part of, uh actually they have a group of conferences every year that sort of all come together in the same week. And one of the major components of that is the Computer Science Education Conference, which I just went to last month. So it has always been an important part (HA faculty).

Computer Availability.

Those comments assigned to “computer availability” as a source of change suggest that new technologies have had an impact on teaching activities in recent years. For example:

Well, I can't just boil it down to one thing, but, uh, technology, that is pretty obvious. We've taken advantage of that; that has made us better teachers. Uh, go through them one by one. Okay, technology, then what? (SP faculty).

Overall, there were 176 comments related to external sources of change in teaching. Of these, 32% related to government, 19% to business, 9% to parents, 26% to professional associations, and 2% to computer availability.

Internal Sources of Changes

Comments made by participants about internal forces that have exerted pressure on teaching activities were related to institutional factors: institutional administration, and departmental administration.

Institutional Administration.

Those comments assigned to institutional administration as a source of change suggest that university decisions and procedures have had an impact on teaching activities in recent years. For example:

Well, now the administration would like to believe that we're going to use technology and we're, and we're going to be able to do things more efficiently, and we're going to do, we'll do things cheaply, and uh, require less of us, and .. that's

what the administration hopes. It seems like we have things, in the math department are actually doing, are probably working the other way around. They- they're going to be more labor intensive (HP faculty).

Departmental Administration

Those comments assigned to departmental administration as a source of change suggest that faculty had noticed some impact on teaching from department rules and procedures. For example:

I think the, uh, primary role in this department is, the department has supported the introduction of technology in this department. Uh, and uh, in doing that has changed the teaching activities. .. not only changed the way some professors, .. lecture, for example, using, uh, notes that are electronic in display or computer. But also he's, he's been able to change the course content in this department. I think it's a very innovative accounting department. We've got a lot of information systems and computers incorporated in traditional accounting courses, and also in new courses that deal with just information systems and computers. I think the department head's supporting that (SA faculty).

Of the 68 comments participants made with respect to internal sources of change, 38% related to institutional administration and the remaining 62% focused on departmental administration.

Personal Factors

All 19 comments assigned to personal factors as a source of change suggest that changes in teaching activities have resulted from self-motivation. For example:

Not really. Not really, because .. the move to technology was .. was, .. a self motivated move. It was something that I wanted to do. You know, if I were not interested in doing so, there might, there might be some pressure. I don't really, I don't really know (SP faculty).

Overall, there were 263 comments made by respondents with respect to sources of change in teaching activities. Of those, 176 (67%) were related to external sources of change, 68 (26 %) were related to internal sources of change, and 19 (7%) were comments related to personal reasons to introduce changes in teaching.

Future Trends in Teaching Activities

The theme “ Future Trends” included all those sections of the interviews that related to faculty perceptions about future trends in teaching activities. Analysis revealed three sub-themes: teaching load, class size, and the use of technology.

Teaching Load

Comments made by participants about future trends in teaching load were assigned to one of two levels: increase, and stable. Those comments assigned to the “increase” category suggest that teaching load will increase. For example:

.. it's quite clear that our department is going to get smaller, teaching loads are going to increase, there will be less support for research and there has been an

attempt to simply to eliminate our graduate program in order to save money. . . if the graduate program were eliminated, of course, the reward for doing research here will vanish. We probably would stop being a department with much interest in research if that happened (SP faculty).

Language assigned to the “stable” category suggests that teaching load will remain stable. For example:

No future trends are apparent, that is, no major change is expected in the near future in teaching content or load. All faculty teach two courses per semester. We tried to do a curriculum revision, but the change is slight. There will not be other changes for at least five years (SA faculty).

Class Size

All comments about future trends in class size suggest that class size will increase.

For example:

I see myself more and more involved in teaching. I expect the teaching loads to go up, or larger classes. I expect to find myself teaching more lower-level courses, and fewer, small upper-level seminars. I expect, for myself, doing more team teaching, more involvement with faculty from other disciplines, as well, and I hope to see myself doing a lot more teaching on the actual Internet. A lot of that depends on how much support the university keeps giving to that kind of work (SP faculty).

Use of Technology

All comments made by participants about future trends in the use of technology suggest that such use in teaching activities will increase. For example:

I think we will go more and more to the use of teaching aids in the classroom. I think we will make much more use of the computer directly in the classroom or computer-produced lectures, support-type material and that's probably where I see things going from the standpoint of the classroom. Who knows, we may teach classes from the office one day with computer technology and distance learning, and things like that, but, you know, if you are talking about for the next five or six years, I just think that we will have more resources to use in the classroom to do a better job of instruction (SA faculty).

Overall, there were 54 comments related to future trends in teaching. Of those, 25 (46%) related to future trends in teaching load, 11 (20%) related to future increases in class size, and 18 (33%) related to future increases in the use of technology.

Impact of Technology on Teaching Activities

The theme “ Impact of Technology on Teaching Activities” included all those sections of the interviews that related to faculty perceptions on how technology has influenced teaching activities in recent years. The analysis revealed three sub-themes: personal contact, use of time, and teaching effectiveness. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-themes are provided in Table 7.

Table 7

Impact of Technology on Teaching Activities (by number of comments)

Characteristics	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Acct. SA n (r)	Total N/% (R)
Personal Contact					
More	10 (6)	2 (2)	0 (0)	0 (0)	12/40 (8)
Less	2 (3)	10 (4)	3 (3)	3 (2)	18/60 (12)
Subtotal					<u>30/49</u>
Use of Time					
More	2 (1)	2 (1)	4 (3)	8 (6)	16/100 (11)
Less	0 (0)	0 (0)	0 (0)	0 (0)	0/0 (0)
Subtotal					16/26
Teaching Effectiveness					
More	0 (0)	6 (5)	6 (6)	3 (2)	15/100 (13)
Less	0 (0)	0 (0)	0 (0)	0 (0)	0/0 (0)
Subtotal					<u>15/25</u>
Total					<u>61/100</u>

* (R) : Number of respondents who made comments

Personal Contact

Comments made by participants related to the use of technology and the frequency of personal contact were assigned to one of two levels: more contact or less contact.

Those comments assigned to the “more contact” category suggest that the use of technology in teaching has increased the frequency of personal contact with students. For example:

To tell you the truth, I mean, I, what I've noticed, it, that my students, now that they can use e-mail, contact me more than they used to. I mean, maybe they get embarrassed by coming here, maybe they get embarrassed about, and get, I get much, many more request now than I ever did (HP faculty).

Comments related to the “less personal contact” category suggest that the use of technology in teaching activities has decreased the personal contact with students.

For example:

Technology, it is efficient, it is efficient. There is nothing easier than simply push a button and get a new slide, talk to it, push a button and you get a new slide, and talk to it, that is efficient. But I am not sure that it this is the best way to convey the information to the students. You need eye contact with the student, you need to be able look that student in their face and ask him, pointedly, a question. You need to have spontaneity in discussions, you need to have an exchange of information. All this moving to newer and newer technology is getting further and further away from those accepted principles of teaching. So I think that technology

is going up in the teaching, I really believe that people are applying those technologies, in general, to the general public, to the general teaching population. And the technology is good for certain things, but not for the general population. So as that technology curve is going up, I believe teaching effectiveness is decreasing (HA Faculty).

Of the 30 comments respondents offered on this topic, 40% reported that technology increased contact with students, and 60% stated it decreased such contact.

Use of Time

All 16 comments made by participants about the amount of time that incorporating technology into teaching takes suggest that the use of technology in teaching is more time consuming. For example:

It's like that program study. It took four to do the program study electronically and, uh, our reviews electronically prove it. I don't, I don't think that's the way to go. I think as long as discussion goes on and you can leave the student and, and accomplish that discussion in a half hours time, where as if you did it electronically you'd have to communicate back and forth, it might-take three or four days to get it done. Take more of the students time and more of my time and be less personal (SA faculty).

Teaching Effectiveness

All the comments (N=15) made by participants about the use of technology as an effective teaching tool suggest that the use of technology in teaching has increased the effectiveness of teaching. For example:

.. technology provides an enriching, enhancing environment for learning. But it never works, unless I'm there, uh, heavily engaged in the same technological process as my students. That means, then, that my time, uh, is taken up, if you will, more uh, with the technology enhanced course, uh, rather than less. And since that's the case uh, I'm very doubtful about the efficacy of the claim that technology will allow us to increase class size. .. and so what I say to anybody who asks me that is uh, I'm not talking about replacing teachers with technology, but rather I'm talking about increasing the reach of teaching (SP faculty).

Overall, there were 61 comments made by respondents related to the impact of technology on teaching activities. Of those, 30 (49 %) were related to personal contact, 16 (26%) were related to the use of time, and 15 (25%) were related to teaching effectiveness.

This concludes the results related to teaching, so attention now turns to the second faculty activity under study in the present study, research.

Results Related to Research Activities

The results related to research are reported in five sections. The four first sections (current status, changes, sources of changes, future trends) relate specifically to the

research questions posed in the study. The fifth section, main sources of funding, is an additional theme that emerged when the interview transcripts were analyzed.

Current Status in Research Activities

The theme “Current Status” included all those sections of the interviews that related to how research was characterized and described by faculty. Analysis revealed two sub-themes: level of involvement in research work, and type of research.

Level of Involvement

Responses related to this category were assigned to one of three levels (high, medium, and low) based on how many hours in a typical week faculty reported they spend in research and related activities. Those comments assigned to high levels of involvement suggest that faculty spend more than 20 hours in research work. For example:

Yeah, I know, that's because before tenure it was probably, you know, 60-20 or 60-30, research over teaching. Now it's more even, and I wouldn't be surprised in a couple years if research will be a little less. Although, uh, yeah, if I go to four courses definitely, teaching will go up a little. Then it will be 40-50 or something like that, 50 teaching, 40 research. But I always expect those to be fairly close and unless I were to become a committee chairman or take a term at being an associate department head or something, I don't see service going up that way (HA faculty)

Comments made by participants related to medium levels of involvement suggested that faculty work between 15 and 20 hours per week in research. For example:

I would say I spend at least 20 to 25 hours on teaching, grading papers, meeting with students out of class, taking phone calls from them at home, let's call it 25. I try to put in about 15 hours of writing and research a week. And service is sort of a seasonal thing, (SP faculty).

Comments made by participants related to a low level of involvement suggested that faculty work less than 15 hours per week in research and related activities. For example:

Yeah, I've, I've, I've thought about that, and the best guess I could make would be about 45% service, 45% teaching, and 10% research. That's a rough guess.

Well I have two courses right now, yeah but, well if it, well if it, you can just work it out, I mean, I, I, I don't know what the total number of hours I spend all week is. It's really hard to tell, might be probably 55 or 60 hours, something like that.

And so, it would be whatever, you know, whatever that works out to be, maybe, maybe uh, you know, 25 hours on research and teaching and 10 hours on, pardon me 25 on service and teaching each, and then maybe 5 to 10 hours on research (HP faculty).

Overall, there were 38 comments made by respondents with respect to level of involvement in research activities. Of those 17 (45%) suggested high level of involvement, 9 (24 %) indicated a medium level of involvement, and 12 (31%) reflected a low level of involvement.

Kind of Research

Responses related to this category were assigned to one of two levels: applied and pure. Assignments were made based on respondents' descriptions about the nature of their research activities. Those comments assigned to "applied research" suggested that faculty research work has practical applications. For example:

.. I primarily do research in two different areas. One is the application of neural networks. The application of neural networks, which is an artificial intelligence based methodology, to do financial prediction tasks. .. one of the areas that I've used applied neural networks is to uh, predict uh, potential corporate targets for wages. Another area that I have worked in is the prediction of bond readings, for corporate bonds, in the bond market. Uh, I'm also working on problems related to bankruptcy prediction. So these are all applications of neural networks and financial prediction tasks. Another area that I work in is called uh, modern management systems, and uh, that area involves the uh, the development of uh, visual interfaces, graphic interfaces, for developing uh, models for modern management systems. Uh, so these are primarily the two areas that I've been working on for the past few years (SA faculty).

Comments made by participants assigned to "pure research" suggested that faculty research work does not have practical applications, or it is related to creative endeavors, as in English department. For example:

My research activities? I am a relatively, an old fashioned scholar. I do research mainly in Shakespeare, and I am presently working on a book on servants and concepts of service in Shakespeare's plays. And, I have done most of the research on this subject. I am now in the process of writing and I have also done some research in other renaissance literature and I occasionally do a little work in popular culture. It is nothing very esoteric (SP faculty).

Overall, there were 38 comments made by respondents related to kind of research activities. Of those, 22 (58%) reported conducting applied research and 16 (42%) focused on pure research. It is important to point out that faculty in the SP department did not use the terms "pure" and "applied" when they described their research work. Rather, they used the terms "traditional" or "modern". However, in the context of this study, traditional and modern research were included in the category of pure research.

Changes in Research Activities

The theme "Changes in Research" included all those sections of the interviews that described how research activities have changed for faculty in recent years. Analysis revealed four sub-themes: nature of research, financial resources, sources of publication, and use of technology in research activities. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided in Table 8.

Table 8

Changes in Research Activities (by number of comments)

Characteristics	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Acct. SA n (r)	Total N% (R)
Nature of Research					
Some	3 (2)	8 (7)	7 (5)	10 (7)	28/76 (21)
No	2 (2)	3 (3)	0 (0)	4 (4)	9/24 (4)
Subtotal					37/20
Financial Resources					
Some	5 (5)	12 (7)	11 (6)	2 (2)	30/77 (20)
No	0 (0)	0 (0)	1 (1)	8 (8)	9/23 (9)
Subtotal					39/22
Sources of Publications					
Some	6 (6)	13 (8)	11 (7)	12 (7)	42/95 (28)
No	0 (0)	0 (0)	1 (1)	1 (1)	2/5 (2)
Subtotal					44/24
Use of Technology					
Some	11 (7)	14 (8)	26 (8)	10 (7)	61/100 (30)
No	0 (0)	0 (0)	0 (0)	0 (0)	0/0 (0)
Subtotal					61/34
Total					181/100

* (R) : Number of respondents who made comments

Nature of Research

Comments made by participants about changes that have occurred in recent years related to the nature of research were assigned to one of two levels: some degree, or no degree of change. Those comments assigned to the “some degree” category suggest that faculty had noticed some degree of change in the nature of research in recent years. For example:

M-my interests are in theoretical computer science. My background ah, is in applied mathematics where I was involved in a lot of scientific computation. So my interests are on the mathematical side of computer science. Now I'm interested in the computation with geometry, and that's a relatively new field within computer science. That's been going for five or fifteen years as a serious field.

Now there are annual conferences devoted to computational geometry and there are new journals devoted to computational geometry (HA faculty).

Comments assigned to the “no degree” category suggest that there have been very few, or no changes in the nature of research in recent years. For example:

No, I mean, I mean, things change a little bit, but it's not radical change. It's still the same area as it was, and as the area evolves, so I evolve, but I mean if you are asking me about some radical change, no (HP faculty).

Financial Resources

Comments made by participants about changes that have occurred in recent years related to financial resources were assigned to one of two levels: some degree, or no degree of change. Those comments assigned to the “some degree” category suggest that faculty had noticed some degree of change in financial resources for research projects in recent years. For example:

.. in that shift .. two things have to, have to happen. One, .. there has been in collaborative research; and two, .. because of this renewed interest by the uh, folks in humanities uh, in technology, we're beginning to see funding for technological research projects coming from uh, technology uh, vendors or suppliers. So we begin to see uh, people, organizations like Apple and IBM, and, and many others .. providing either equipment uh, or software, or expertise or some combination of those things; to select the projects with, say, teaching humanities more uh, humanities research, and so on. We're, of course, just beginning this process. Far away from the degree to which, uh, say science research uh, maybe funded by .. the corporate world .. and so on; but it's possible (SP faculty).

Comments assigned to the “no degree” category suggest that there have been few or no change in financial resources for research activities in recent years. For example:

Uh, I, not, I wouldn't say recently, no. In my, my years there is not lot of funding for, for research. I mean, uh, you have, we just don't, we just don't depend on external funding 'cause, uh, it's just not, not available. When you have like, there's

like a couple of CPA firms that, that give out maybe, \$100,000 a year to, to, for a you know, the entire but like in my area, there are like 1,500 people who're teaching, teach tax accounting and you know, .. a couple hundred thousand dollars among those people is not much per, you know, just not much, not much of it at all (SA faculty).

Sources of Publication

Comments made by participants about changes that have occurred in recent years related to sources of publication were assigned to one of two levels: some degree, or no degree of change. Those comments assigned to the “some degree” category suggest that faculty had noticed some degree of change in the sources of publication of research in recent years. For example:

The other big change, though, is the possibility of publishing things electronically now on the Internet. My last book was published partly as a computer disk and partly as a book, with the book accompanying the computer disk, because that was the most efficient way to store this particular kind of information in the book. And now, one of the projects that I am working on will only exist in electronic form on the Internet. It won't be published at all in the usual sense, although it is possible that we may work a deal with some university press to handle the advertising and marketing of this project, particularly if we decide to produce a CD ROM version of it. But this project will never be a book, so I mean it will only exist as electrons on the Internet or as a CD ROM, one or the other. So this possibility of publishing

things on one's own, in electronic form, is entirely new and it's going to reshape the way we think of publication and the dissemination of research in the future. This is the biggest change (SP faculty).

Comments assigned to the "no degree" category suggest that there has been little or no change in the sources of publication in recent years. For example:

No. They're much the same as they... I am in a specific area, .. and the same journals that existed ten years ago exist now. It's the same conventions. There has been no sort of separate area and it's much the same. I go to the same convention every year. After that, it's been greater than in other fields. It was never as high as it should be in the humanities, and so it's still not high. It has, this has not affected me (SP faculty).

Use of Technology

All comments made by participants about changes that have occurred in recent years related to the use of technology in research activities suggested that faculty had noticed a significant degree of change in the use of technology in research activities. For example:

Oh, it's greatly increased. I think, uh, I've not used technology very much, but if you look around the department, I think the successful research in here is, is much more involved with computing now than, than it used to be. There've always been some people working with computational uh, methods. Almost everybody that

does research now has some kind of computing that goes, goes with it, and, and I think there've been, there've been some very exciting results that people have done. So, yes, I think the availability of uh, high speed computing has effected the content of the research because people can do different things, and issues have changed (HP faculty).

Overall, there were 181 comments related to changes in research activities. Of those, 37 (20%) related to the nature of research, 39 (22%) focused on financial resources, 44 (24%) discussed sources of publication, and, 61 (34%) related to the use of technology.

Sources of Research Funding

The theme “ Sources of Research Funding” included all those sections of the interviews that related to main sources of funding for research activities. The analysis revealed two sub-themes: private and federal funding.

Overall, there were 40 comments related to sources of funding. Of those, 28 (70%) suggested that the main sources of funding were government or the university. For example:

In my discipline, no, things have been getting worse because of the cuts in funding to the National Endowment for Humanities which is really the primary funder of research in my discipline. We don't get money from business, we don't get much money from government, except through the National Endowment for Humanities.

And the national funds, which seem to be doing things, are going to be a lot worse in terms of funding. There is a little private money around, but not a lot in English studies (SP faculty).

Twelve (30%) comments suggested that there are some private sources of funding.

For example:

Yeah, there's very little funding that takes place. That's uh, the, we've had one of the, uh, large CPA firms funded some auditing research for a while, \$20 million a year into it for funding for auditing research. That was taken advantage of to a large extent, probably, but there was very little other opportunity to get funding for research in this area (SA faculty).

Sources of Change in Research Activities

The theme "Sources of Change" included all those sections of the interviews that related to how research activities have been affected in recent years. Analysis revealed three sub-themes: external sources of change, internal sources of changes, and personal factors. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided in Table 9.

External Sources of Change

Comments made by participants about external forces that have influenced research activities included: government and professional association.

Table 9

Sources of Change in Research Activities (by number of comments)

Sources	Math HP n (r)	Comp. Sci. HA n (r)	English SP n (r)	Acct. SA n (r)	Total N/% (R)
External					
Government	9 (6)	5 (4)	3 (3)	0 (0)	17/32 (13)
Prof. Assoc.	3 (2)	7 (7)	8 (5)	7 (6)	25/47 (20)
Subtotal					42/44
Internal					
Inst. Admin.	5 (5)	2 (2)	5 (5)	4 (2)	16/41 (14)
Depart. Admin.	4 (4)	6 (5)	6 (6)	7 (7)	23/59 (21)
Subtotal					39/41
Personal Factors	5 (3)	4 (4)	5 (4)	0 (0)	14/15 (11)
Total					95/100

* (R) : Number of respondents who made comments

Government.

Those comments assigned to “government” as a source of change suggest that government policies have been perceived as factors affecting research activities in recent years. For example:

Uh, the government has a lot to do with our research activity because of grant funding. Uh, they really can direct the direction of a lot of research. If something has a lot of money in it, then people will do it. In some areas, where there’s not so much money, some people will do it anyway, but it’s not as, there’s not as much vigor. And the way economics are, the department is very dependent on these grants. [What] we have, our operating budget from the Dean and the college, is not enough to buy all the paper for Xeroxing and things like that, and telephone bills. So we use overhead from grants for a lot of department activities. So the grants are very important for the department, and we try to resist the temptation to, uh, encourage people to go after grants and only do research in areas with grants, but it’s still obviously very important. (HP faculty).

Professional Associations.

Those comments assigned to “professional associations” as a source of change suggest that those associations have had an impact on research activities in recent years.

For example:

Well, as I said, I think if you are talking about the Modern Language Association, ah, I think for the last 15 or 20 years they have been pushing a more theoretical

approach, a deconstruction approach, an approach that emphasizes multiculturalism and feminist studies, homosexual studies, and that sort of thing. And some people are doing that, and some people are doing other things (SP faculty).

Internal Sources of Change

Comments made by participants about internal forces that have exerted pressure on research activities included: institutional administration, and departmental administration.

Institutional Administration.

Those comments assigned to institutional administration as a source of change suggest that university procedures have had an impact on research activities in recent years. For example:

Well, the Dean is certainly interested in computer-aided education, so in that sense he encourages that research area, certainly to the extent that the Dean gives the department more or less, more resources or less resources. Uh, they are more able to do things or less able to do things, but I think our position there hasn't changed a whole lot (HA faculty).

Departmental Administration.

Those comments assigned to departmental administration as a source of change suggest that department rules and procedures have affected research activities. For example:

Yes, you are expected research, and you are expected to do, ... and you are expected to publish research, but the particular kind of research you do is not dictated. Ah, in this department, for example, to get tenure the usual rule is you are to have, by the time you come for tenure, you are to have finished a book and five or six articles, and you are also expected to have attended several conferences. But what area you do this in, and what theoretical tack you take, that's up to you. It seems to be very little pressure for the particular kind of research. The problem is the amount. After you get tenure, the pressure seems to be very different. Now you are talking with somebody who has only had tenure for less than three years, okay, so I am not as knowledgeable as some of my colleagues are. Ah, but it depends on, very largely then, on whether you want to go up to full or not. If you want to be promoted to full professor from associate, then, there is, you have to keep on publishing. Ah, if you don't, to be perfectly honest, as far as I can tell, some people simply stop, and publish almost nothing (SP faculty).

Personal Factors

Those comments assigned to personal factors as a source of change suggest that changes in research activities are the result of faculty self-motivation. For example:

I have changed my research because, .. no actually that's, the decisions that I've made in my research career have been entirely on my own and that ah, I can say that I've been supported in this by the department. And it could be that if I had made different decisions, maybe they would be even less supportive, but I never had pressure, I have been motivated to do research, but deciding what kind of research I've been completely independent in this (HP faculty).

Overall, there were 95 comments made by respondents related to sources of change in research activities. Of those, 42 (44%) related to external sources of change, 39 (41%) related to internal sources of change, and 14 (15%) were comments related to personal reasons.

Future Trends in Research Activities

The theme "Future Trends" included all those sections of the interviews that related to faculty perceptions about future trends in research activities. Faculty responses related to their future responsibilities in research activities were assigned to one of three levels: increased, decreased, and stable.

Increased Activity

Those comments assigned to the “increased” category suggest that research work will increase. For example:

I think that the, the hope is doing more, .. the hope is that we do good scholarly work and publish it in journals .. that we try and, ah, get outside funding to help support graduate students, to help us, ah, expand the knowledge of the discipline (HA faculty).

Decreased Activity

Those comments assigned to the “decreased” category suggest that research work will decrease. For example:

Well, well, as I say, as I said, I’m gonna do what I want to do. Probably I will be doing less research. I, I’m tenured. So I don’t care, I’m immune from these kind of pressures. That’s the purpose of tenure. I don’t, I’m immune? Means I don’t, I don’t. They’re irrelevant to me. They can’t, what can they do to me. I can’t, I can’t lose my job over those kind of pressures. All that can happen to me is that I don’t receive awards, but I can’t receive any punishments. That’s the purpose of tenure. I was given tenure, in my opinion, because now I can make my own judgments about these things. And, therefore, I will. And my, my own judgment is that, .. that the kind of, .. writings and work I want to do are, are not this kind, what I’ve done traditionally, what I did to get tenure, which is this academic type of research. I want to do broader writings. Now, what do I expect is gonna happen

as a result of that? I expect that I will not be promoted. I don't expect to be promoted. ... will I get raises? I don't know. Some, some, but not what I could've gotten. Uh, but it doesn't matter. It, I don't know, it doesn't matter. Probably I won't get paid anyway (SA faculty).

Stable Activity

Those comments assigned to the "stable" category suggest that research work will remain the same. For example:

I don't see huge change. It will remain the same. I can't, I'd be shocked if at a place like this institution research was ever, uh, really down-sized or not emphasized. ... but I do anticipate some slight changes. Uh, at least for me personally, I anticipate some more flexibility like what I was talking about. So that people like me could still do research but not as much, certainly not as much as I was trying to do before I got tenure, and probably not as much as everybody in the department. Some people in the department they can supervise 15 graduate students. I found that I can't do that. You know, two or three and I go crazy above that. And, and some people in the department can juggle six or eight grants at a time. Uh, I go nuts so, so, I, I'm optimistic that I have the freedom to do that. If I completely quit doing research then I'll feel like I'm not doing my job. But I'm hopeful that we'll have more flexibility and I think it's going to happen. Maybe I'm naive, but I think so (HA faculty).

Overall, there were 41 comments made by respondents related to future trends in research activities. Of those 21 (51%) suggested that research work will increase, 8 (20%) suggested that research work will decrease, and 12 (29%) suggested that research work will remain stable.

Given these results with respect to trends in research activities, attention now turns to service issues.

Results Related to Service Activities

The results related to service are reported in four sections. These four sections (current status, nature of changes, sources of changes, future trends) relate specifically to the research questions posed in the study. No additional themes emerged when the interview transcripts were analyzed.

Current Status in Service

The theme “Current Status” included all those sections of the interviews that related to how service was characterized and described by faculty. Analysis revealed two sub-themes: level of involvement, and nature of service activities.

Level of Involvement

Responses related to this category were assigned to one of three levels: high, medium, or low levels of involvement. Assignments were based on responses offered when faculty were asked about how many hours in a typical week they spend in service

related activities. Those comments assigned to the category of high level of involvement suggest that faculty spend more than 20 hours per week in service work. For example:

Oh boy, well, I'm in a peculiar position right now, because I'm the director of graduate studies. OK. So, this is not going to be typical for colleagues here because most of them don't have that kind of administrative role to play. So, I would say, let me think for a moment, I'm usually here, about 50 hours a week, and I would say it breaks down to probably, uh, and then there's some work at home. .. I would say probably, excuse me we got somebody, ok, I would say it probably breaks down to something like 35 hours of service, .. probably 15 or 20 hours of teaching, and probably only, maybe 5 or 10 hours on my own research right now. That, that will change when I stop doing this heavy service load, and the service will drop, and the research will go back up, but right now that's about the way it breaks down. It's about 50 or 60 hours a week (SP faculty).

Comments assigned to the category of medium level of involvement suggested that faculty spend between 15 and 20 hours per week in service work. For example:

Well it, it certainly, the season, it varies with uh, the time of year, uh, the time of the semester, so early in the semester I would guess that I spend about, uh, 10 hours on research, about uh, about, well then maybe I'd guess 20 hours on teaching and 20 hours on committee work, and uh, well maybe not so many, maybe not so much on committee work, but that's, yeah maybe, well ok, they'll, they'll stay, actually no, probably increase the amount of teaching, so maybe I'd

say 25 on teaching. .. I would say that 15 uh, on committee work. Uh, teaching, well committee work actually, 'cause the committee work swells, it swells, it increases enormously towards the end of the semester because there are many, many things that, uh, uh, let's say committees that are formed at the beginning of the semester have to uh, finish their work at the end of the semester so uh, so there's, there is uh, reports have to be written so it's, uh, the amount of committee work increases (HP faculty)

Comments made by participants related to a low level of involvement suggested that faculty work less than 15 hours per week in service related activities. For example:

Uh, let's see, I would say that it's uh, (pause), it's probably, uh, 40% research, 40% teaching, 20% service, maybe, maybe less service than that. Maybe, maybe 45%, 45%, 10% but my research and teaching are almost equally split. I mean, the way I do it, my classes are typically on Tuesday and Thursday and uh, so like on, on Monday in the, in the morning uh, I do, I work on research so say until two o'clock in the afternoon and then I start working on, on class and then on, on Tuesday and Thursday on my class, when I have my class, I spend all day Tuesday on class, either teaching or getting ready for it and Wednesday's like Monday and, and Thursday is, is like uh, is Tuesday except uh, Thursday afternoon, after I'm through with class, I'll go back to my research and Friday, will be mostly, mostly research. In terms of hours, I'd say, .. I do a lot of work on the weekend too. I'll

say probably, I spend uh, say,_(pause) I'd say 20 hours a week on, on teaching, 30 on, 30 on research, and maybe five on service (SA faculty).

Overall, there were 38 comments made by respondents about their level of involvement in service activities. Of those, 9 (24%) were assigned to the category high level of involvement, 8 (21 %), and 21 (55%) were assigned to the medium and low levels, respectively.

Nature of Service Work

Responses in this category were assigned to one of four categories: the institutional level, the departmental level, service outside of the university, and service at the professional association level. Those comments related to the institutional category suggest that faculty are involved in service work on campus. For example:

I am also on faculty senate ah, so I have to meet once a month with people from around the university for faculty senate meetings. I am, also I am on a working group in faculty senate having to do with post-tenure review that met every couple of weeks and, ah, I am also on a space allocation committee in the department because the Deans are moving out of this building and have been given that space and we have to decide how we are going to use that space and I am probably leaving out one of two things, but it is like that, I go to a lot of meetings. That's sort of thing (SP faculty).

Those comments related to the "departmental" category suggest that faculty are involved in service work at the department level. For example:

Thirty hours a week on service, yeah. I'm chairing the teaching committee in the Mathematics Department, I'm chairing the Commission on Undergraduate Studies which is implementing, trying to implement, a new eligibility policy, and I've been spending most of my time doing that uh, except for the fact that I'm also on the search committee for Academic Affairs for which there were 125 applications, and I had to read all of them. Now I read very fast, but that's what I've doing for the past two weeks. Now two weeks from now, I'll be spending more time teaching and maybe, just maybe, I can spend a couple of hours on research. But I've got a rather substantial service load, due to the fact that no good deed ever goes unpunished. If you find someone, if you want to find someone to do a job, give it to someone who's busy. Well, I'm busy, so they, give me more things to do. Well, I'll do them, so they, you know, there are a lot of people in the department that way and in the university that way. They just want you to do more and more (HP faculty).

Those comments related to work outside the academy suggest that faculty are involved in external service work. For example:

I am the U.S. representative to the International Federation of Information Processing uh, Technical Committee Seven, which deals with modeling in optimization. So I serve in, in, in an international capacity. I .. uh (pause) typically in a year, I would be called upon to write between 4 and 6 letters of recommendation or reference for faculty being promoted at other universities in

this country, or even for a chaired faculty member at a university in, in the U.K. So .. uh, I'll continue to do those kinds of duties. I probably will not be quite as energetically active as I used to be, I'm just getting older (HA faculty).

Those comments related to the professional association category suggest that faculty are involved in service work at the professional association level. For example:

Uh, it's primarily service to the, to the college and the department and the university. In the past I've done a lot of service outside, uh, being members of practitioner oriented organizations in this area. I was president of the Roanoke chapter of the National Association of Accountants and held a lot of offices there and the state level, too. But, ... say 10 years ago it became pretty apparent that that's not going to be rewarding. In fact, it may hurt you in, uh, salary adjustments and promotions, and I started shirking away from it (SA faculty).

Overall, there were 81 comments were offered about the nature of service activity among departments. Of these, 19 (23%) were assigned to the university category, 36 (44%) to the department category, 20 (25%) to the external category, and 6 (7%) to the professional association category. In general, faculty talked more extensively about service work at university, departmental, and professional association level (74%) than outside activities (7%).

Changes in Service Activities

The theme “Changes in Service” included all those sections of the interviews that described how service work has changed for faculty in recent years. Analysis revealed two levels of comments: some degree of change, and no degree of change. The number and percentages of comments assigned to each category are provided in Table 10.

Those comments assigned to the “some degree” category suggest that there has been some degree of change in the kind of service work in which faculty have been involved in recent years. For example:

Service is overwhelming, and it has changed in recent years. I do more service than anyone else I know, ha, ha! And I don't think, I don't think that everything I do should be called service. I do a lot of organizing the faculty into projects, like organizing three interdisciplinary teams, and so on. It is administrative service. I do a lot of that. I also do a lot of just running around showing individual people how to do things on their computers. Some of them are staff, some of them are faculty, some of them are students. I just do a lot of service. I took them all willingly, but, .. part of it it's just a need. We need people to do what I'm doing. The English department reached this point we had a lot of computers and a real interest in learning to use it, and, I, be, the department had asked me to be the chair of the Technology Committee a year ago only. And I've already been doing a certain amount of this. But I took on that chairship, .. I guess, I really I didn't have to but I pretty much threw, really threw myself into it, I will say, and taught

Table 10

Changes in Service Activities (by number of comments)

Changes	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Acct. SA n (r)	Total N/% (R)
Some	30 (9)	15 (9)	16 (8)	11 (6)	72/90 (32)
No	0 (0)	1 (1)	0 (0)	7 (4)	8/10 (5)
Total					80/100

* (R) : Number of respondents who made comments

a lot of people how to do web by web pages at the department. Web pages, drawings, I just do a lot of things. I didn't have to. I could just have done the committee, and chaired the committee in a different sort of way. I just took it on, I just took it on. Somebody had to. It was time for somebody to do that (SP faculty).

Those comments assigned to the "no degree" category suggested there had been no degree of change in the kind of service work in which faculty have been involved in recent years. For example:

Uh, not really, because if there is an area that I think that I have a lot of flexibility in, it would be that area. And I can move into the service area and move out of the service area without it having a tremendous impact on my role as a teacher. And the orientation is the same. It hasn't changed. Not really, because I'm heavily involved at the departmental level, .. I'm heavily involved at the university level, and I continue to be pretty heavily involved at the professional level. I don't really see that, certainly in the last five years or so, that hasn't changed almost at all. The only thing that has changed there, a little bit, is the way my service activity varies from year to year. It doesn't remain constant, but I'd say my departmental and university commitment has pretty much stayed the same (SA faculty).

Overall, there were 80 comments made by respondents related to service work. Of those, 72 (90%) suggested that service work has changed in recent years, and 8 (10 %) suggested that service work has not changed, or has remained stable in recent years.

Sources of Change in Service Activities

The theme “Sources of Change” included all those sections of the interviews that related to the main sources of change in service activities in recent years. Analysis revealed two sub-themes: external sources, and internal sources of change. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided in Table 11.

External Sources of Change

Comments made by participants about external forces that have influenced service work were related to those external constituencies that have impacted service work, such as government and professional associations.

Government.

Those comments assigned to “government” as a source of change suggest that government policies and decisions have had an impact on service work in recent years. For example:

... but there is a push from the State Higher Educational Council and the State Legislature and the University, that's where the push comes from for outreach activities. It's a huge push for outreach activities, it comes from the University, and

Table 11

Sources of Change in Service Activities (by number of comments)

Sources	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Accounting SA n (r)	Total N/% (R)
External					
Government	3 (2)	0 (0)	1 (1)	1 (1)	5/45 (4)
Prof. Assoc.	2 (2)	3 (3)	1 (1)	0 (0)	6/55 (6)
Subtotal					11/27
Internal					
Inst. Admin.	9 (7)	0 (0)	2 (2)	3 (2)	14/47 (11)
Depart. Admin.	7 (7)	3 (3)	2 (2)	4 (3)	16/53 (15)
Subtotal					30/73
Total					41/100

* (R) : Number of respondents who made comments

the State Council Higher Education, no, not, from parents or others, but of course the State Legislature is really reflecting, I believe, the political pressure of parents (HP faculty).

Professional Associations.

Those comments assigned to “professional associations” as a source of change suggest that those associations have affected faculty service work in recent years. For example:

I think they can also, .. set some priorities. For instance, our, I mentioned the special interest groups and this ACM, Association of Computing Machinery, it's a special interest group on computing for assistance to the physically handicapped. Uh, that indicates to the profession and through the professional society that that's important, and I think it is. Ah, we've seen the professional association actually help to define what technology was needed in uh, uh, secondary schools. What technology was needed at the elementary and, and, and, uh, primary levels. Or what should be goals for school districts that we have, or the special interest group on computer science education deals with undergraduate, and then deals with high school and primary and elementary, of education. So it's not just university-based. So that, they have been, .. in fact there is now in this department a, .. uh, a project that, uh, tries to establish a programming contest for high schools, high school students (HA faculty).

Internal Sources of Change

Comments made by participants about internal forces that have exerted pressure on service work were related to those institutional factors that have influenced service activities, including: institutional administration and departmental administration.

Institutional Administration.

Those comments assigned to “institutional administration” as a source of change suggest that university procedures have affected service activities in recent years. For example:

Oh, the university, as well as the department, encourages you to do more. They never, they never, .. can articulate exactly what it is you should do less of, but it's always more. So, that's how I perceive the entire university message always is.

The university message wants us currently, or at least for a while there, they were saying they wanted more teaching, more and better teaching, more service, more research. But they didn't want less of anything. They didn't want less research, and less service, you never heard that, all you heard was more, more. I don't pay attention to those things. They want a lot of everything. So, I don't pay any attention to somebody, any of those messages, where they want more of something unless they articulate exactly what that's replacing (SA faculty).

Departmental Administration.

Those comments assigned to “departmental administration” as a source of change suggest that department decisions and procedures have had an impact on service work.

For example:

Yes, the DH has uh, has uh, appointed me to these positions and has been very encouraging in, in saying that the time I spend on these things is worthwhile, and, uh, he’s also been able to find some administrative salary for me in the summer to help, to help finance the, the work I do on things in the summer (HP faculty).

Overall, there were 41 comments made by respondents related to sources of change in service activities. Of those 11 (27%) were related to external sources of change, and 30 (73 %) were related to internal sources of change.

Future Trends in Service Activities

The theme “Future Trends” included all those sections of the interviews that related to faculty perceptions about future trends in service activities. Faculty responses about their future responsibilities in service activities were assigned to one of three levels: increased, decreased, and stable levels of activity.

Increased Activity

Those comments assigned to the “increased” category suggest that service work will increase. For example:

I think I'll be more involved in, uh, I will be more involved in, uh, you know, uh, I'd only be more involved in service than I have been, I think. I'll be assigned more

responsibilities. It's, generally in the academic arena, the more experience you have in the academic environment, the more you are expected to provide back to the academic community. And that's fine because you know, as an assistant professor when he was talking of, uh, you need your time to focus on your teaching and research and develop professionally. And once you, you are able to do that, now it's time to provide that knowledge you have gained back to the academic community. So a lot can be done for what, you know, using service oriented functions. So I think it's, it's expected that, uh, the more senior you get, the more service you have to provide (SA faculty).

Decreased Activity

Those comments assigned to the “decreased” category suggest that service work will decrease. For example:

I'll, I'm probably going to try to decrease my service activity somewhat 'cause I think I've allowed it to get to be too, too big a part of the week. I'd like to devote more time to teaching and research (HP faculty).

Stable Activity

Those comments assigned to the “stable” category suggest that service work will remain stable. For example:

I don't see service changing that much. I don't think that it will change, .. I think it's valuable, .. but it's not as hard. Maybe I haven't found enough challenging service but, .. it's important work, committee work, for example, certainly advising

student organizations and that sort of thing, .. but it's not, I don't find it as challenging or demanding as, you know, there's not as much room, at least, I know I don't have the right mind set, but there's not enough room for creativity, and for really growing as a professional like there is in teaching and research. Just something you got to do because it's part of the job (HA faculty).

Overall, there were 34 comments made by respondents related to future trends in service activities. Of those, 16 (47%) were assigned to the "increased" category, 6 (18 %) were assigned to the "decreased" category, and 12 (35%) were assigned to the "stable" category.

The previous data were related to all those changes, sources of changes and future trends in teaching, research, and service activities. The next section reports data collected with respect to current status, changes and sources of change in recognizing and rewarding teaching, research, and service activities in recent years.

Results Related to the Reward System in Teaching

The results related to the teaching reward system are reported in three sections that relate specifically to the research questions posed in the study: current status, changes, and future trends.

Current Status in Rewarding Teaching

The theme "Current Status" included all those sections of the interviews that described what factors the institution considers when rewarding teaching activities. Analysis revealed two sub-themes: evaluation, and reward procedures. The sub-themes,

the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided in Table 12.

Evaluation

Comments made by participants related to procedures used by the institution to evaluate teaching activities were coded into two categories: peer evaluation, and student evaluation.

Peer Evaluation.

Those comments assigned to peer evaluation suggest that peers are a factor considered by the department in evaluating teaching. For example:

Well, this department we, ah, do quite a bit of peer evaluation of teaching, where, ah, another faculty member will, .. sit in on a faculty member's lectures, will review his syllabus, will review the tests, .. and then will write a detailed letter, ah, to the department head summarizing the findings of all the total evaluation (HA faculty).

Student Evaluation.

Those comments assigned to the student evaluation category suggest that this category is a factor considered by the department in evaluating teaching activities. For example:

And, uh, and teaching, why is teaching difficult to evaluate? Actually, teaching is probably easier to evaluate, but the way we evaluate teaching, for instance, based on teaching evaluations, that is just one of the many criteria that should be used in teaching evaluation. In fact, I would think the most effective way of evaluating

Table 12

Current Status in Rewarding Teaching Activities (by number of comments)

Sub-theme	Math HP n (r)	Comp. Sci. HA n (r)	English SP n (r)	Accounting SA n (r)	Total N/% (R)
Evaluation					
Peer Evaluation	13 (7)	17 (9)	16 (10)	0 (0)	46/38 (26)
Student Evaluation	18 (10)	15 (9)	18 (9)	25 (8)	76/62 (36)
Subtotal					<u>122/62</u>
Rewards					
Department Support	2 (2)	0 (0)	3 (1)	1 (1)	6/8 (4)
Promotion	2 (2)	1 (1)	5 (3)	4 (4)	12/16 (10)
Salary Increase	16 (10)	2 (1)	11 (7)	5 (5)	34/45 (23)
Awards	2 (2)	8 (6)	8 (5)	5 (4)	<u>23/31 (17)</u>
Subtotal					<u>75/38</u>
Total					197/100

* (R) : Number of respondents who made comments

teaching is to ask a student after 10 years, or 20 years after he has graduated, and come back and say okay, if he remembers any of the things that have been taught, as, to you know, how do you evaluate this teacher? Have you learned, I mean, what, whatever, whatever this person has taught, taught you, has it helped change your life in any way? I think that would be a more appropriate way of teaching, you know, evaluating teaching, not just asking a student at the end of a semester, asking did you like this class or not (SA faculty).

Rewards

Comments made by participants related to procedures used by the institution to reward teaching activities were coded as: departmental support, promotion, salary increase, and awards.

Departmental Support.

Those comments assigned to the “departmental support” category suggest that faculty had noticed the department rewarding teaching activities. For example:

Primarily, salary. Yeah. Yeah. You know, uh, and computer support, you know, and that, I have been, I have been lucky, uh, if I need a computer product, I’ve been able to get, it uh, so that, you know, I have some of the latest technology and, uh, in my case, uh, some of that technology is much more expensive than, uh, what other colleagues are, uh, using. Uh, a vast majority of the faculty, uh, have computers on their desks. You know, if it’s not on the desk here, they’ve taken them home. That, uh, practically every faculty member in this department has, uh,

has his or her own computer. And that's, that's a lot of money, you know, it's a lot more money than a, uh, than a typewriter and, uh, you know, they didn't furnish faculty members typewriters. And I think the department has done very well, uh, especially, for a uh, for department in the humanities, where, again, there's much less outside funding (SP faculty).

Promotion.

Those comments assigned to the "promotion" category, suggest that this category is considered by the department in rewarding teaching activities. For example:

It does make a difference in promotion and tenure cases. There is no doubt about it, teaching is more important in tenure that it used to be (SP faculty).

Salary Increase.

Those comments assigned to the "salary" category suggest that that salary increase is a way to reward teaching activities by the department. For example:

We, at the end of each class, the students fill out questionnaires that indicate how satisfied they were with the teacher and, .. these are these are the, the largest basis for evaluation of teaching. .. I don't think they're a particular good way of doing it, but I don't know a better way to do it. But, at any rate, when, if someone does consistently very well in uh, these evaluations then it definitely shows up in salary increases and .. and also, .. various awards and prizes that are given (HP faculty).

Awards.

Those comments assigned to the “awards” category suggest that faculty had noticed that the department recognizes faculty by their efforts in teaching activities. For example:

Oh, no, the, the uh, this department has been very fortunate in, uh, having .. people recognized with a Certificate of Teaching Excellence that is uh, given at the college level, and we have one winner of an alumni, uh, alumni teaching award, uh, so we've been, uh, I think all of those could have helped. And in the graduation ceremonies, departmental graduation ceremonies, and not only is, if, if someone, is--whether they win the CTE certificate or not, the outstanding teacher or teachers for the year are recognized in that ceremony (HA faculty).

Overall, there were 197 comments made by respondents related to rewarding teaching. Of those, 122 (62%) related to how teaching activities are valued by the departments, and 75 (38%) related to how teaching activities are rewarded by the departments.

Changes in Rewarding Teaching

The theme “Changes in Rewarding Teaching” included all those sections of the interviews that described how the recognition and reward system for teaching activities has changed in recent years. Analysis revealed two levels of comments: more recently valued, and undervalued.

More Valued

Those comments assigned to the “more valued” category suggest that teaching and related activities have been more recognized and rewarded in recent years. For example:

I'm sure there may be departments that say we want to do both research and teaching, but I think, more and more, that if he is a very good teacher and an average researcher, they will get a reasonable evaluation. One time they almost ignored the teaching. Now, I think, they pay a lot more attention to the teaching (HP faculty).

Undervalued

Those comments assigned to the “undervalued” category suggest that teaching and related activities have not been properly recognized and rewarded. For example:

Regarding teaching, the department gives an annual teaching award, but that reward is granted by the department head without consultation from anyone else. It seems to be given to whomever is coming up for promotion and needs a boost. That is, it seems to be given for political reasons (this is not sour grapes; I have received this award). Truly, good, or better, or best teaching does not seem to be rewarded because there is a denial by all involved (chairman of department, P&T committee members) that teaching can be evaluated. In particular, student evaluations are not trusted, and no other measures are attempted. If someone has trouble in the classroom, (students complain or they mismanage), then teaching can count against you

(some untenured folks have lost their jobs). In the absence of outstandingly poor performance, there is no recognition given to teaching (SA faculty).

Overall, there were 60 comments related to recent changes in recognizing and rewarding teaching. Of those, 41 (68%) were assigned to the “more valued” category, and 19 (32%) were related the “undervalued” category.

Future Trends in Rewarding Teaching

The theme “Future Trends” included all those comments related to faculty perceptions about how they would like to be rewarded in the future for teaching activities. Faculty responses were grouped in five general sub-themes: departmental support; working conditions; rewards; motivational factors; and, do not know how to better reward teaching in the future. The sub-themes, and the number and percentages of comments are provided in Table 13.

Departmental Support

Those comments assigned to “departmental support” included statements about the need for more time to devote to teaching, more TAs, more travel funds, and other issues that addressed what the department might do to better reward teaching. For example:

And the, another reason that I've had to change my style of teaching is the support that we normally get, the GTA support. Graduate teaching assistance. It used to be, we would, get, we could pretty much be guaranteed, we would get half

Table 13

Future Trends in Rewarding Teaching Activities (by number of comments)

Trends	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Accounting SA n (r)	Total N/% (R)
Department Support	11 (8)	15 (8)	13 (6)	17 (17)	56/44 (29)
Working Conditions	2 (1)	7 (6)	5 (4)	2 (1)	16/13 (12)
Reward System	5 (4)	4 (2)	5 (5)	9 (6)	23/180 (17)
Motivational Factors	7 (5)	0 (0)	6 (4)	6 (5)	19/15 (14)
Don't know	6 (3)	2 (1)	3 (2)	1 (1)	12/10 (7)
Total					126/100

* (R) : Number of respondents who made comments

a GTA per 20 students. So if we had 35 or 40 students, we would get a full GTA, with 80 students you'd get two GTAs. For the last semester, with this 120 students, I got one GTA to support the grading. They are taking the teaching, you know, you know they are given, they are making the classes larger, give me less support, and they, less GTA support, and yet they expect your teaching evaluation from the students to get higher, well how can that be when you get larger classes (HA faculty).

It would be very helpful to be able to use our time more wisely, definitely. If I could devote less time to, uh, teaching and, uh, not just less time if I, if I could just do teaching in a very concentrated fashion, like Monday-Tuesday teaching, and then Wednesday, Thursday, Friday I just devote to research, I could do something like that. Yeah, that would be very, very helpful. And not only that. all my meetings should also be on Monday and Tuesday. All my service oriented meetings. Let me give you an example. Suppose I have a meeting at noon on Wednesday, okay. Midday, at noon on Wednesday. That means I basically, uh, from the morning when I start doing my research, basically at 11:30 a.m. I have to let go and start preparing for this meeting. And then I go to this meeting, okay, and then I have the meeting last for about an hour. And when I come back, maybe there will be some discussions related to the meeting with colleagues, and so on and so forth. I'm thinking about the meeting and by the time I really can focus back

onto my research, it might be about 3, 4 o'clock. So, having one meeting midday on Wednesday, it probably destroys the whole day as far as research is concerned. So it's not the time, amount of, specific amount of time that I'm doing, spending on service or teaching, what, what I, what I need to be, need to have, as far as to be productive is, I do not want any interruption on Monday or Wednesday. I just want the whole day available for doing research because it takes me time some time, I'm--so what I was saying is .. I want .. uninterrupted time on Monday, Wednesday, and Friday to do research. So that's why, uh, it's not just the number of hours that are available, it's the number of uninterrupted hours that are available to do research and teaching related activities (SA faculty).

Working Conditions

Those comments assigned to the “working conditions” category suggest that faculty would like better facilities to improve the quality of their teaching. For example: Well, if I think about how I spend my time now, this is how I spent my time, say five years ago. I have to do a lot more things that secretaries used to do. We have, we used to have four people, or maybe five or six people, that were in the Mathematics Department office. And then we have, well I'd say, for the job that we used to have, three people doing, handling office things. She's not very good so it's almost like, it's almost like not even having one person. So people have to type their own letters, people have to type their own papers, research papers, and type their own papers. I mean technology has made that easier, you see, that's

what happens. Technology makes it easier, and so now you can do it yourself, and maybe you have complete control over how it happens, ok, but that means that you have to do it. I think what is happening is that there is more and more of a shift of a lot of these elementary tasks onto the faculty. They have to do xeroxing for the classes, they have to do, well, I mean, grading, we used to, well I'm not sure. I'm not sure that we had that many more graders and teaching assistants before, but, you know, you have to do your own grading, you have to do your own xeroxing, typing, and you know this is time consuming work (HP faculty). Uh, almost everything else costs money, uh, but maybe it's not money that goes straight to me, it's, it's things like .. more support so that my graduate students could go to conferences, .. better support for computing in the department. We have a lot of pre-sophisticated computers and we don't have enough staff to help keep them all running. So the faculty members have to end up doing a lot of, sort of, system administration with computers that we shouldn't have to do (HA faculty).

Rewards

Those comments assigned to the "rewards" category included statements about promotion and tenure, awards, and innovation in teaching. For example:

Well, I, I don't know how. I obviously don't know how they can do that. As I've said, I prefer it to be recognized in my teaching activities at the time of promotion, and, and raises, and that sort of thing. And that's, that's about all they can do as an

institution. They can, they can tell other people what I'm doing and that sort of thing, but that doesn't, so what? (laugh) (SA faculty).

I am, I am involved in, uh, a number of groups that are investigating distance learning, and, of course, educational technology, and I believe that it's important for the university to develop reward mechanisms to encourage people to use educational technology and to participate in distance learning . And so, those activities are very important for our future as an institution, and there is a very little reward that is given to the faculty who are engaged in those. So, I think that's a very important area that the university should devote more attention to (HA faculty).

Motivational Factors

Those comments assigned to the "motivational factors" category suggest that faculty would like to have more control over their work and receive more respect for what they do. For example:

The way, the way, the way I get rewarded for, for teaching is, is by, .. right now we're going through, for example, a curriculum revision process, all right. The way I get rewarded is that I'm on that committee and, .. and I have, .. a lot of influence, not only on the members of the committee but on the department head, and I think, in the end, what ends up getting done in here will be a lot of my influence. I think the primary reward is, is .. is, .. how do I say this. I was going to say authority, but I don't mean that. The primary reward is to have something that

you're identified, that you can identify as being yours, as having possession of something. I think that's the way you should be rewarded. What I, what I mean by that is why people really like the research. Individuals like research because your name is on that article, that's yours, you have possession of that, you've done something that's identified with you and it's yours. ... people tend to feel some moral obligation, or what, or get some, some pleasure from their teaching, because it's their class, and they get to create it, that's theirs, they have ownership of that. But I don't think in, in our system, in this department, we are not allowed, I don't think any of us feel any ownership or identity with anything that goes on in this college, in this university or in this department, because it's done very autocratically and we don't take ownership. We lost one of our top faculty, and I know we lost her because of, because of this exact issue. She wanted, she wanted to have, she didn't want to dictate, but she wanted to have a means of giving input where she could see she made the difference. We don't have that here (SA faculty).

I think we all are taking teaching more seriously than we did ten years ago. I think that we're seeing it much more as an important and valuable part of our job rather than just an annoying thing that we have to do. So I think that's, I think it's given more value than it was given before. I think it's given maybe a bit more respect, however, I think there's still, I think we still have difficulty, giving maybe the right measure of respect to people that only do teaching. I think that's, I think, there is

still, there's still a hierarchy here, the best researchers will be at the top of the hierarchy, and best teachers will be far below that (HP faculty).

Do Not Know

Those comments assigned to the “do not know” category suggest that faculty do not know better ways to evaluate and reward teaching activities. For example:

Oh, I don't know that I have anything to add to what I've already uh, said, I mean, you know, there's some change in the way teaching has been evaluated, that's important, that is peer review and other sorts of things; some universities use portfolios. I think, I think there need to be, and I don't know that I have them all in mind, there need to be some serious, continuing serious thinking about how teaching could be better evaluated (SP faculty).

Overall, there were 126 comments made by respondents related to future trends in recognizing and rewarding teaching activities. Of those, 56 (44%) related to departmental support for teaching activities, 16 (13%) related to better working conditions, 23 (18%) related to the reward system, 19 (15%) related to motivational factors, and 12 (10%) were assigned to the “do not know” category.

Results Related to Rewards in Research

The results on the reward system for research activities are reported in three sections related specifically to the research questions posed in the study: current status, changes, and, future trends.

Current Status in Rewarding Research

The theme “Current Status” included all those sections of the interviews that described what the institution considers in valuing and rewarding research activities. Analysis revealed two sub-themes: evaluation, and reward procedures. The sub-themes, the positions identified within sub-themes, and the number and percentages of comments assigned to each position and sub-theme are provided in Table 14.

Evaluation

Comments made by participants about the most frequent procedures used by the institution to evaluate research activities were coded as: publication, grants, and participation in conferences.

Publication.

Those comments assigned to the “publication” category, suggest that publication records are highly considered by the department in evaluating research work. Publication records included number of journal articles, quality of journals in which articles appear, and quality of books published. For example:

The only thing that really gets rewarded in this department is research, and that, publication. Publications. Publishing books, particularly, and publishing articles in important journals. And it is rewarded by, only people who do that are going to get promoted to full professor, and they get more money, they get better raises...(SP faculty).

Table 14

Current Status in Valuing and Rewarding Research Activities (by number of comments)

Sub-themes	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Accounting SA n (r)	Total N/% (R)
Evaluation					
Publications	35 (10)	15 (6)	49 (10)	29 (9)	128/78 (35)
Grants	15 (7)	5 (3)	0 (0)	0 (0)	20/12 (10)
Conf. Participation	6 (4)	10 (6)	0 (0)	0 (0)	16/10 (10)
Subtotal					164/73
Reward					
Salary	7 (7)	3 (3)	8 (5)	3 (3)	21/35 (18)
Departmental Support	7 (4)	1 (1)	0 (0)	2 (2)	10/16 (7)
Low Teaching Load	2 (2)	0 (0)	4 (4)	2 (2)	8/13 (8)
Promotion and Tenure	5 (5)	1 (1)	8 (5)	8 (5)	22/36 (16)
Subtotal					61/27
Total					225/100

* (R) : Number of respondents who made comments

Promotion is a function of publication. Raises, well, the number and quality. You can have 25 lousy, low level publications and not be promoted. You can have two high quality publications and be promoted. So, not pure number, but number is important (SA faculty).

But I think the quantity, there has been a shift there as well. Publication, books, articles, chapters, poems, book reviews. To some extent numbers, although obviously books count more than articles, count more than book reviews, and so forth. Certain kinds of books would count more than other kinds of books. A long critical book, published by a major university press, would probably count more than a collection of essays or a bibliography published by a lesser press (SP Faculty).

Grants.

Those comments assigned to the “grants” category suggest that obtaining external funding is considered important by the department in evaluating research work. For example:

Well, .. publication in, in, in well known journals is very important, and .. grants, you know, funding is very important in your evaluation, and, well, number of grants and the amount of money. I mean, if, if you bring in a million dollar grant that's very, people are very glad of it, because, see the department gets some of its expenses paid by the overhead money that comes in with the grants. So it's essential that we have some grants coming in or otherwise many of the travel

activities and, and, uh, even some of the more routine activities of the department will be have to be cut back if we didn't have overhead money coming in from grants. So that's extremely important and also it's an important recognition of the quality of, of, of your work (HP faculty).

Conference Participation.

Those comments assigned to the category of "conference participation" suggest that such participation is highly valued by the department in promotion and salary increase decisions. For example:

In our department, you get tenure based on publications and research. You get promoted to associate professor and tenure based on your publications and the level of funded of research. Okay, now, to move to the next level, to full professor, you are expected to do what you did at the associate level, at the untenured level which is, you are expected to publish and do funded research. But, in addition, to move to that next level, you have to get professional visibility, which means you have to work with conferences, you have to chair conference sessions, you have to be program chair for the conference. So, for you to move from the associate to full professor, it is expected that your level of participation at the professional level will increase substantially (HA faculty).

Rewards

Comments made by participants related to the most frequent standards used to reward research activities were coded as: salary increases, department support, low teaching load, and, promotion and tenure.

Salary Increases.

Those comments assigned to the “salary” category, suggest that research activities are rewarded by the department with salary increases. For example:

All promotion, tenure, and salary adjustments are based on evaluation of research activities, and research is measured strictly, in our department, by the number of publications and the quality of journals. Quantity and quality can trade-off, a lot of articles in poorer journal counts as much as a few articles in high quality journals (SA faculty).

Department Support.

Those comment related to the “departmental support” category suggest that the department provides some resources and facilities to faculty who are doing outstanding research. For example:

Yes, salary increases. Uh, there are some other things that the department provides to researchers, uh, uh, there’s some money available for support for travel, uh, let’s see, there is research study leaves. So you’ve been at the university for six or seven years then you’re entitled, well you’re not entitled you can apply, to have a year off and half salary. Uh, now that’s understood to be, uh, to enhance research,

so if someone is not doing well at research, there'd be some question as if that's a worthwhile thing. So, the research study leaves, which will, are some, I guess, sometimes called sabbaticals, uh, are very, are closely related to research, that's a reward (HP faculty).

Low Teaching Load.

Those comments assigned to the "low teaching load" category suggest that a lighter teaching load is assigned to those faculty who are more involved in research activities. For example:

The rewards at this institution lie in becoming an administrator and staying away from students. If you want to make money here, you need to become an administrator and do that instead of teaching. Alternatively, you could make somewhat less money by being more involved in research which also, to a considerable degree, involves staying away from students because you have a lighter teaching load. Faculty who do more research have less teaching load whenever possible. This is a reward. And then there are fellows, like me, the, who have a fairly heavy course load and see a lot of students, and don't get very well rewarded for it. It's like that everywhere. We didn't invent the situation, ha, ha! (SP faculty).

Promotion and Tenure.

Those comments assigned to the “promotion and tenure” category, suggest that faculty who are more involved in research activities are rewarded with promotion and tenured positions. For example:

Research in this department is valued and rewarded very highly. I think, .. research is rewarded mostly through promotion and tenure, and salary increase of course. I would say that among teaching, research, and service, I think in service and teaching you've got to be adequate. And I think most people can reach that level. .. and then basically everything else is on research (SA faculty).

Overall, there were 225 comments made by respondents related to valuing and rewarding research work. Of those, 164 (73%) were related to how research activities are currently evaluated by the department, and 61 (27 %) were related to how research activities are currently rewarded.

Changes in Rewarding Research

The theme “Changes in Rewarding Research” included all those sections of the interviews that described how recognition and rewards in research activities have changed in recent years. Analysis revealed a single level of comment. Research is highly valued.

Research in this department, .. very, very, well, that is considered the main goal in this department. Uh, although they talk about teaching being the main goal, the main goal has really been research. That is, if you do research you get promoted,

and having equipment, and better facilities to bring the researchers here (SP faculty).

Well, (pause) to do good research, .. I think what I need is large chunks of consecutive, contiguous time. I, I, having time 2 hours today, and 2 hours tomorrow, and 3 hours the day after tomorrow, doesn't help, 'cause I need, if I, I'm doing research, I would like the whole day, or the whole week devoted to this research. So basically, you know, things like if I were to just teach one semester you get good salary raises, you get good things happening to you, low teaching loads, all these things, prestigious committees and so on. Without research you don't get much of that (HP faculty).

Overall, there were 67 comments related to changes in rewarding and recognizing research activities. All of those reflected that recognizing research activities has not changed to any degree because research work has always been, and continues to be, highly valued.

Future Trends in Rewarding Research

The theme “ Future Trends” included all those sections of the interviews that related to faculty perceptions about how they would like to be rewarded and recognized for research in the future. Faculty responses were grouped in two general sub-themes: departmental support, and rewards (see Table 15).

Table 15

Future Trends in Rewarding Research Activities (by number of comments)

Trends	Math HP n (r)	Comp.Sci. HA n (r)	English SP n (r)	Accounting SA n (r)	Total N/% (R)
Departmental Support	10 (9)	11 (5)	9 (5)	6 (5)	36/65 (24)
Reward	5 (3)	9 (4)	5 (4)	0 (0)	19/35 (10)
Total					55/100

* (R) : Number of respondents who made comments

Departmental Support

Those comments assigned to the “departmental support” category included comments about increased research assistance, more time, more travel money, and better working conditions. In general, faculty would like to have better support to improve the quality of their research activities. For example:

Well, yeah, they can, they can do some things that can be done for rewarding research, but I think it finally comes down to money. ... it would be nice (pause) we also talked about equipment and the possibility of going to research centers, and do the rest of the time, you know, do research the rest, rest of the time, I would be more productive in research (SA faculty).

Now you can provide certain other kinds of reward. You can give people a little extra travel money for research projects, you can give a little better teaching schedule, give them courses that they might rather teach, you know, minor kinds of things of that sort. It wouldn't be a bad thing to have my own parking space. But generally there is not any much better way to reward teaching, scholarship, and research than we have now. The only thing I can think of that would be helpful would be to make it clear exactly what percentage of the raise is based on which of the components (SP faculty).

Rewards

Those comments assigned to the “rewards” category all suggest that faculty would like to have monetary rewards for their research work. For example:

Money, money is the best reward. However, we don't have salary increases very often. That is exactly right, that is exactly right. Now what kind of incentive is that? That is ridiculous, that is ridiculous. You know, and now, and that, look at the salary increase over the last five years. Three years, no raise. Last two years 2% raise, 3% raise. Come on, give a break, give me a break. If I get a good offer, I mean, personally I am looking, I'll leave, and I won't look back. This is ridiculous, ridiculous. The type of rewards that people need right now are monetary rewards, and they need to be decent. I am expressing it as my personal opinion, but I believe that opinion is shared by many people in the department and in the university. You know, you don't leave a university because, .. because you don't get a pat on the back because you do something. You leave the university because you don't make the money that you're supposed to (HA faculty)

Overall, there were 52 comments made by respondents related to future trends in recognizing and rewarding research activities. Of those, 33 (63%) were related to departmental support for research activities, and 19 (37 %) were related to rewards.

Results Related to Rewards for Service

The results related to the reward system for service are reported in three sections related specifically to the research questions posed in the study: current status, changes, and future trends.

Current Status in Rewarding Service

The theme “Current Status” included all those sections of the interviews that described what the institution considers in valuing and rewarding service activities.

Analysis revealed two sub-themes: evaluation, and reward processes.

Evaluation

Comments made by participants related to the most frequent procedures used by the institution to evaluate service activities were coded as: committee membership, or “do not know”.

Committee Membership.

Those comments assigned to the “committee membership” category suggest that committee work is considered by the department when evaluating service activities. For example:

Well, the way it is evaluated is committee chairs give their comments to the department head about the performance of people that are on each committee. And, certainly, there will be some people who made a special contribution in certain areas of service that deal with problems that arose that year, or to make some improvements in the department, and that would get recognition because the contribution of what those people did. And, .. otherwise, the, there are some numeric measures, like the number of committees you serve on, and whether you serve on committees at the university level versus department level (HA faculty).

Do Not Know.

Those comments assigned to the “do not know” category suggest that faculty do not know how service work is evaluated and rewarded. For example:

Well, uh, that’s a good question. I’m not sure, I think uh, I imagine that it, it has to do with impact on the department, what contributions have you made that have impacted the department, you know, possible things? Have you, I think, I think generally service is not rewarded very much, and it doesn’t, it certainly does not carry its own rewards, there’s no intrinsic rewards. But I think it’s, uh, well, I don’t know how service is valued and rewarded in this department (HP faculty).

Reward

Comments made by participants related to the “reward” category suggest that money is considered by the department as a reward for service work. For example:

Service is kind of thought of as uh, uh, a less important component of, of the salary and promotion judgments. It’s, I think if you, if you do an excellent job in teaching and research you really only would have to do a nominal amount of service and it wouldn’t, wouldn’t make much difference. On the other hand, if you do a great deal of service, beyond a certain amount it doesn’t help you any more, so service is probably the least rewarded area. Well, I mean, I think it’s partially factored into the salary increases up, up to a certain amount, but, but beyond that, we, our evaluations are done by, partly by the DH, but also by a committee of

faculty members and the faculty members on the committee are generally not too sympathetic toward service (HP faculty).

Overall, there were 23 comments related to how service work is currently valued and rewarded by the department. Of those, 19 (83%) related to evaluation standards, and 4 (17%) related to reward procedures. Of the 19 comments related to the evaluation process, 13 (68%) focused on committee work, and 6 (32%) were assigned to the “do not know” category. All the comments in the reward category were related to monetary reward.

Changes in Rewarding Service

The theme “Changes in Rewarding Service” included all those sections of the interviews that described how rewards in service activities have changed in recent years. Analysis revealed two level of comments: fairly valued, and undervalued.

Fairly Valued

Comments assigned to the “fairly valued” category suggest that service activities have been fairly considered by the department in the evaluation and reward process. For example:

In recent years, .. I would say I'm beginning to see changes in the character of evaluation, uh, and reward. .. I think our university is trying to figure out ways of giving fair rewards to people who do that kind of work. .. again, reward evaluation, uh, which, uh, recognizes that this is, uh, work of, uh, merit equal to, uh, publishing, or, uh, equal in some respects to, uh, teaching. So I would say that

that's, uh, a change. Again, we aren't where we would like to be, by far, but there're certain, rewards for service work (SP faculty).

Undervalued

Comments assigned to the “undervalued “category suggest that service activities have not been considered by the department in promoting, and recognizing service work.

For example:

I do not think that anybody gives a damn about service, to be perfectly honest. I think that, with rare exceptions, it is pretty much ignored, ah, in terms of how many committees you are on and so forth, I don't think that anybody cares. Ah. I think that, I think that certain people are pressured, people who do not have tenure are pressured to be on committees, and we talk about being careful of their time, to make sure that they have time to do the research that they need to get tenure, this is the only way you are going to get tenure in the department unless you publish. Teaching and service count for nothing in terms of getting tenure (SP faculty).

Overall, there were 56 comments related to changes in recognizing service activities in recent years. Of those, 8 (14%) suggested service was fairly valued, and 48 (86%) suggested service was undervalued.

Future Trends in Service Rewards

The theme “ Future Trends” included all those sections of the interviews that related to faculty perceptions about how they would like to be rewarded in the future for

service activities. There were very few comments about future rewards in service work, and faculty responses related to promotion, and less paper work, as rewards for service activities. For example:

I know that is a common complaint among faculty that, that particularly young people who are advisors get no reward back that I can see, uh. But, well, I guess I could say this, maybe, by some miracle a situation would arise where they would tell me that they are going to make me a full professor because of my service activity. But one, I don't think that they will do that, but it would be nice (SP faculty).

You know, about the only thing that I would like to see happen, if maybe there could somehow be a reduction in the paper pushing that has to be done. Paper pushing, you know, the kind of service work is not very productive sometimes. Spend a lot of time doing, sinking in a lot of time for something that's not personally, in my opinion, is not that valuable (HP faculty).

Overall, there were 11 comments related to faculty perceptions about future rewards for service work. Of those, 6 (55%) were related to the "promotion" category, and 5 (45%) related to the "less paper work" category.

Having described the departments and sample under study in the present research, and reported the numbers and types of comments participants made with respect to the research questions posed in the study, it is essential to discuss those results and their implications for future research and practice. The final chapter provides such a discussion.

CHAPTER V

DISCUSSION, LIMITATION AND IMPLICATIONS

This chapter begins by answering the research questions through the findings revealed in data collected. Second, the relation of the findings to previous literature is presented. Third, the limitations of the study are examined. Fourth, implications of this study for future research and practice are suggested.

Teaching, Research, and Service Activities

The first research question in this study related to the teaching, research and service activities faculty are currently engaged in. Without exception, the faculty interviewed are engaged in teaching, research, and service activities. Teaching activities are split between undergraduate and graduate teaching, and 76% of the faculty reported high involvement in teaching activities. One possible explanation for these results is that the departments selected in this study have heavy teaching loads, especially undergraduate teaching. The Math and English departments earned 31,824 and 19,379 credit course hours, respectively, in fall, 1995, primarily because they offer a large number of courses for the campus (see Table 3).

In the research, the data revealed that faculty are less involved in research work than teaching. Only 45% of respondents reported a high level of involvement in research, and 58% reported they were engaged in applied research. One possible explanation for

these results may be the technological orientation of the institution under study, which places more emphasis on applied research.

In service, the majority of faculty (55%) are less involved in service work than in teaching and research activities, and the majority of that service (44%) takes place at the department level. Although a possible explanation for these results could be found in the relationship between level of involvement in teaching activities and service work for those departments with heavier teaching loads, there are not major differences among the number of comments in relation to service work at the department level. Another interesting observation is that it seems to be a dramatic shift in the definition of service work by faculty. In the past, service work for faculty meant public outreach activities (working in the community helping to improve social and educational issues), in contrast in this study, when faculty talked about service work they mentioned activities that in the past were considered part of the job (committee work at the university and at the department level). In that regard, faculty notion of service work has changed, it seems to be no longer considered public service.

In summary, respondents reported the highest degree of activity in teaching, followed by research, then service activities. These results are contradictory to previous research employing the Biglan Model according to which “hard” areas reported less commitment to teaching and high commitment to research and soft areas reported more commitment to teaching. In this study, “hard” areas reported high commitment to teaching, and high commitment to research, and “soft” areas reported less commitment to

teaching. “Pure” areas reported more commitment to service work than the other clusters. This contradicts previous work in which “pure” areas reported less commitment to service (Biglan, 1973b).

Changes in Teaching, Research, and Service

The second research question focused on changes in teaching, research, and service activities in recent years. In general, the results revealed differences in teaching by Biglan characteristics in terms of class size, teaching style, curriculum reform, team work, and technology innovation.

In terms of class size, some interesting differences emerged along Biglan continua. The “hard” areas offered a significantly greater number of comments about increasing class size (21) than did respondents in the “soft” departments (2). Likewise, participants from “pure” departments offered nearly twice as many comments about increased class sizes (15) as their counterparts in “applied” areas (8). This suggests that class sizes in math and computer science are expanding more noticeably than those in English and accounting, and classes in math and English are growing to a greater degree than those in computer science and accounting (see Table 5).

All the results suggest a high degree of change in teaching style, curriculum reform, and team work. The most significant difference in teaching style, however, was reported between “applied” areas (34) and “pure” areas (14), suggesting that computer science and accounting faculty have adapted their styles more significantly in recent years than faculty in math and English. Just the opposite is true in the area of curriculum reform,

however, where math and English (the “pure” departments) reported significantly more change (16) than computer science and accounting (6). In team work, the “applied” areas reported a higher degree of change (21) than the “pure” areas (11). It would appear that while math and English faculty are addressing curriculum areas, computer science and accounting are focusing on adapting their teaching styles to reflect greater team work among students.

By far, however, the greatest degree of change in teaching relates to the increased use of technology in the classroom (213 comments). While respondents in all four clusters acknowledge these developments, those in the “pure” departments discussed it much more extensively than those in the “applied” departments (129 versus 84 comments), suggesting that technology is now influencing even the most traditional disciplines in the academy, like math and English.

In terms of changes in research, the only significant difference among departments also related to the use of technology. While respondents in all four Biglan clusters reported an increased use in technology in their research activities, those in the “soft” areas reported a higher degree of change (36) than those in “hard” areas (25), and those in “pure” areas reported a greater change than those in “applied” areas (37 versus 24 comments) suggesting that certain departments (math, computer science, English) are employing more technology in research than other departments (accounting). Or, perhaps, technology has always been employed in accounting research, so the degree of change in that department is less evident (see Table 8).

In the area of service, the respondents in all departments reported some degree of change, but faculty in the “hard” and “pure” areas offered many more comments about this change (45 and 46, respectively) than “soft” and “applied” areas (27 and 26, respectively). Again, three of the four departments (math, computer science, English) reported a greater change than the fourth department (accounting). In particular, faculty in math elaborated on this theme, offering 42% of all comments about this topic. Perhaps this is due to the significant degree of curriculum reform that has occurred in the Math Department in recent years, changes that have required an extensive amount of committee work on the part of faculty (see Table 10).

The respondents noted a number of sources prompting these changes in teaching, research and service, most notably government and professional associations. This was particular true for faculty in “pure” and “hard” departments, who offered a total of 55 comments about the influence of government, versus their counterparts in the “applied” and “soft” departments who offered only 24 such comments. The opposite is true in terms of the influence of professional associations in prompting change, which “applied” faculty cited more frequently (45) than faculty in “pure” areas (31). This was also true for faculty in “soft” departments, who offered a total of 43 comments about the influence of professional associations, versus their counterparts in the “hard” departments who offered 33 such comments. Evidently, the influence of government is stronger for math and English and professional association are more influential in computer science and

accounting. However, the major influence of professional associations in accounting was reported in the teaching area (see Table 6, 9, and 11).

The respondents also offered some comments related to the impact of technology on teaching activities, most notably in increasing the personal contact with students. This was particularly true for faculty in “hard” areas, who offered a total of 12 comments on personal contact, versus their counterparts in the “soft” departments who offered 0 comments. Likewise, participants from “pure” departments offered greater a number of comments (10) than did respondents in “applied” departments (2). These results suggest that technology has increased the personal contact with students in certain departments (math) than in others (computer science, English, accounting). Or, perhaps, technology has been employed in teaching activities for a longer period of time in the computer science, English, and accounting departments, therefore, faculty in those departments perceive that technology, rather than increasing, has decreased the personal contact with students. Whereas, in the math department, it might be possible that the use of computers is widespread in teaching, therefore, there have been not noticeable changes in personal contact (see table 7).

In summary, it would appear that teaching, research, and service activities have changed for faculty in all four Biglan clusters in recent years, but some elements of that shift have differed according to Biglan criteria. One possible explanation could be due to the differences in sources that promote changes in some departments more than others, for example, while government and professional associations were reported as the main

sources of change in math, English, and computer science departments in teaching, research, and service, business is an important source of change in teaching activities in the accounting area.

Future Trends in Teaching, Research, and Service

The third research question focused on faculty perceptions about future trends in teaching, research, and service activities. In general, the results revealed differences by Biglan characteristics with respect to the use of technology in teaching.

The “soft” areas offered twice as many comments about future increases in the use of technology in teaching (12) than their counterparts in “hard” areas (6). This was also true for faculty in “applied” areas, who reported more comments related to increases in the use of technology (13) than those in “pure” areas (5). These results suggest that the use of technology will continue to increase in certain departments (accounting) more than in the others (math, computer science, English). Or, perhaps, the accounting department has not widely incorporated the use of technology in teaching activities, therefore faculty perceive that in the future, the use of technology will increase. Another possible explanation is that the other departments (math, computer science and English) are already involved in extensive use of technology in teaching activities, so that their perceptions about future increases place less emphasis here.

In terms of future trends in research, the only significant differences that emerged along the Biglan continua were related to future increases in research responsibilities. While all the respondents reported an increase in their research duties, those in “hard”

areas reported more than twice the number of comments (15) than those in “soft” areas (6). These results suggest that certain departments (math) will increase their research responsibilities more than the other departments (English, accounting). It is reasonable to suggest that because the math department is currently more involved in teaching activities than research, faculty believe they need to increase their level of involvement in research work in the future.

In terms of future trends in service activities, no major differences were reported among the four departments. However, respondents in all four Biglan clusters expect service work to increase in the future.

The Current Reward System

The fourth research question focused on how teaching, research, and service are currently recognized and rewarded. In general, the results revealed differences by Biglan characteristics in terms of the evaluation system.

In teaching, some interesting differences emerged along the Biglan continua. The “hard” areas offered a significantly greater number of comments about the use of peer review (30) than did respondents in the “soft” departments (16). Likewise, participants from “pure” areas offered many more comments about the use of peer review (29) as their counterparts in “applied” areas (17). In terms of student evaluation, some differences were also reported. The “soft” areas reported a greater number of comments in the use of student evaluations in teaching (43) than did the respondents in the “hard” departments (33). These results suggest that certain departments (accounting) do not consider the use

of peer review in teaching activities to the same extent that the other departments do. Or, perhaps faculty in the accounting department do not consider peer review a valid measure of teaching activities (see Table 12).

In terms of research, some interesting differences emerged along the Biglan model with respect to publication, grants, and conference participation as important factors in evaluating research work. The “soft” areas offered a significantly greater number of comments about publication as a factor highly considered in evaluating research work than “hard” departments (78 versus 50 comments). Likewise, “pure” areas offered nearly twice as many comments (84) than “applied” areas (44). In terms of grants, the only significant difference among departments were offered by faculty in “hard” areas, who discussed it much more extensively than those in the “soft” areas (20 versus 0 comments). Finally, in terms of conference participation, the major differences were offered by faculty “hard” areas, who placed more emphasis on it than those in “soft” areas (16 versus 0 comments). These results suggest that publication is a more important factor in valuing research work in certain departments (math, English) than other departments (computer science, accounting), whereas, grants and conference participation are more valued in the math and computer science departments than the English and accounting departments. Perhaps faculty in the computer science department do not publish as much as faculty in the other departments because knowledge in the computer area changes so fast, and the publication process involves so much time, that conference presentations have replaced publication in terms of evaluating research (see Table 14).

In terms of evaluating service, no major differences in the number of comments offered by faculty in the four departments were noted.

With respect to rewards in teaching, the only significant difference among departments was related to salary. While respondents in all four Biglan clusters offered comments about salary increases, those in the “pure” areas offered a significantly greater number of comments (27) than did respondents in the “applied” departments (7). These results suggest that some departments (math, English) are rewarding more teaching activities in terms of salary increases more so than other departments (accounting, computer science) (see Table 12).

The only significant differences among departments in rewarding research were related to salary increase and promotion. Although faculty from all four departments offered comments about salary increases and promotion, those in “pure” areas offered more comments (15) than respondents in “applied” departments (6). Likewise, participants from “soft” areas offered nearly twice as many comments about promotion as a reward for research activities (16) than their counterparts in “hard” areas (6). These results suggest that certain departments (math, English) are rewarding research with salary increases and promotion more than other departments (computer science and accounting). Or, perhaps, salary increases and promotion have always been a way of rewarding research work in computer science and accounting (see Table 14).

In term of rewarding service, no major differences in the number of comments were offered by faculty in the departments under study.

In summary, the results revealed differences among the departments in the way that teaching, research, and service are rewarded which is consistent with previous research on the Biglan model (Smart & McLaughlin, 1978).

Changes in the Reward System

The fifth research question focused on how recognition and rewards have changed in teaching, research, and service activities in recent years. In general, the results revealed teaching has been more valued in recent years. The “pure” areas offered a significantly greater number of comments about valuing teaching more (30) than did respondents in the “applied” departments (11). In contrast, the “soft” areas offered a significant greater number of comments about teaching as a less valued activity (17) than “hard” departments (2). These results suggest that certain departments (math and English) are recognizing teaching more than the other departments (computer science and accounting). Or, perhaps, teaching activities have always been fairly valued in the computer science and accounting departments, so faculty did not offer comments related to that. Or, perhaps, teaching is being more recognized in the math and English departments because those departments are more involved in teaching service courses.

The only significant difference among departments about changes rewards for research was related to research activities. While respondents in all four Biglan clusters reported research as a highly valued activity, those in “soft” areas reported a greater number of comments (44) than those in “hard” departments, suggesting that, in the

English and accounting departments, research is more highly valued in promotion and tenure decisions than in the computer science and accounting departments.

Some interesting differences also emerged among departments in relation to service activities. While the respondents in all four departments offered comments about service as an undervalued activity, those in “soft” areas offered nearly as twice as many comments (31) than did respondents in the “hard” departments (17), suggesting that the extensive amount of service in those areas substantially reveals the value it receives in the reward structure.

In short, it appears that among teaching, research, and service, teaching has been more valued in recent years, research continues to be a highly valued activity, and service continues to be an undervalued activity. These results are consistent with previous research that has examined the relationship among teaching, research, and service with respect to reward systems (Hoyt, 1974; Rossman, 1976; Tuckman & Hagemann, 1976)

The Future Reward System

The last research question focused on how faculty perceive that teaching, research, and service should be recognized and rewarded in the future. In general, the results did not reveal significant differences in terms of how teaching should be rewarded in the future. The only significant difference among departments was related to motivational factors. The “soft” areas reported a greater number of comments (12) than “hard” departments (7). Likewise, participants from “pure” departments offered twice as many comments about motivational factors (13) as their counterparts in “applied” areas (6). These results

suggest that in certain departments (math, English, accounting), faculty perceive that motivational factors are necessary to encourage them to be more productive (see Table 13).

The only significant difference among departments was in the area of research was related to departmental support. Those in “hard” areas reported a greater number of comments on departmental support (21) than those in “soft” areas (15). This result suggests that more departmental support for research is perceived by faculty as an important factor to increase research work (see Table 15).

In terms of service, no major differences were reported among the four departments. However, the “soft” areas offered more comments about rewarding service with promotion than those in “hard” departments (5 versus 0 comments), suggesting that service work should be considered in terms of promotion.

In summary, it would appear that even though there is not a balance in terms of rewarding teaching, research, and service, faculty do not have a lot of ideas about how to create rewards that better reflect their efforts and contributions to the institutional mission.

Relation Between the Results and Previous Research

Many of the results of the present study support previous research. For example, comments by respondents in this study suggest that external constituencies, particularly government and professional associations, have exerted pressure to increase productivity. This is consistent with previous studies (Ashar & Shapiro, 1990; Dill, 1982; Hauptman,

1993; Kennedy, 1995; Shapiro, 1993) which have supported the changes that have occurred as a result of external pressure.

The present findings are also consistent with previous research in terms of the complex nature of faculty work. Respondents reported that the nature of their work is so complex that it is difficult to differentiate teaching, research, and service activities. Nearly all respondents had difficulty describing how their time was spent in a typical week. Previous research has suggested the need for more accurate measures that yield a global picture of faculty activities and reflect the essence of the academic work (Blackburn, 1974; Hopkins, 1990; Kallio & Wilger, 1995; Schalock. et al., 1993).

The present findings are also consistent with previous research in terms of faculty dedication to teaching, research, and service activities. Some faculty reported that their teaching and service activities are closely related to the characteristics of the department, and that evaluation and reward systems should be more in balance with the diversity of activities in which faculty are involved. Previous research has suggested that diverse characteristics of the departments make the relationship between productivity and discipline difficult to determine (Beymer & Hall, 1978; Warner, Lewis & Gregorio, 1981).

In terms of peer evaluation and student evaluation as viable forms of evaluating teaching, the present results are consistent with previous research. The respondents reported that both forms of evaluating teaching are employed at the institution under study, but neither form is particularly useful. This supports previous findings that student evaluations supplemented by peer evaluations, and peer evaluations supplemented by

portfolios are more viable measures of teaching success, but that truly reliable evaluation measures have not yet been developed (Centra, 1977; Creswell, 1985; Menges, 1991).

Respondents uniformly supported previous studies that research productivity is the most highly valued activity when promotion and rewards are under consideration (Cooper & Hensley, 1993a, 1993b; Massy & Wilger, 1995; O'Neill & Sachis, 1994; Ross & Donnellan, 1991). Additionally, the present participants acknowledge that grantsmanship, curriculum reform, and the development of new courses are also considered in the evaluation process, though they could not identify the weight such activities were given in the reward structure, just as previous scholars acknowledge the value of these activities (Braxton & Bayer, 1986; Braxton & Toombs, 1982; Pellino, Blackburn & Boberg, 1984)

Respondents also supported the notion that available resources, departmental support and working conditions impact productivity, consistent with previous research (Birnbaum, 1991, 1992; Bowen & Schuster, 1986; Rebne, 1990).

Another consistency between this study and previous research relates to the notion of rewards. The present sample clearly articulated that rewards are most closely tied to research activities, consistent with Hoyt's (1974) findings. However, the respondents also suggested that more balanced rewards were needed on the campus under study, suggesting that their productivity would increase if a more reasonable reward structure were created. This is consistent with recommendations made by others scholar who argue for more well-balanced reward systems (Blackburn, 1974; Johnson & Tuckman, 1985; Kasten 1984; Katz, 1973).

Finally, the respondents reported differences with respect to publication of articles or books, which varied among disciplines. These results are consistent with previous findings (Biglan 1973a; 1973b; Muffo & Langston, 1981; Smart and McLaughlin, 1978).

However, some findings in this study contradict previous studies employing the Biglan model. For example, “hard” areas reported high commitment to teaching and high commitment to research, unlike previous studies. Likewise, “pure” areas reported more commitment to service work than “applied” dimensions (Biglan, 1973b). Furthermore, some categories included in this study were not considered by previous works, such as: recent changes, sources, and future trends in teaching, research, and service activities. The new categories introduced in the present study prohibited comparisons to previous research. A summary of the consistency between current research and previous studies is presented in Table 16.

Limitations

Like all research projects, there were certain limitations to this study. First, given the qualitative techniques employed, the results of this study are generalizable only to those specific departments studied, and will have limited generalizability to similar departments on other university campuses.

Additionally, all of the participants in the present study were volunteers who agreed to participate. A number of faculty declined participation. It is possible that the volunteers differed in some significant ways from their non-volunteering counterparts. If so, results might be skewed in some way.

Table 16
Summary of Consistency Between Current Research and Previous Studies

Characteristics	Math HP	Comp.Sci. HA	English SP	Acct SA
Level of Involvement				
Teaching	-	-	-	-
Research	-	-	-	-
Service	-	-	-	-
Changes in Teaching				
Class Size	NR	NR	NR	NR
Teaching Load	NR	NR	NR	NR
Student Advising	NR	NR	NR	NR
Sources of Changes Teaching, Research, and Service				
External				
Government	+	+	+	-
Business	NR	NR	NR	NR
Parents	NR	NR	NR	NR
Prof Assoc.	+	+	+	+
Comp Avail	NR	NR	NR	NR
Internal				
Administration	+	+	+	+
Department Head	+	+	+	+
Personal Factors in Teaching, Research, and Service	+	+	+	+
Impact of Technology in Teaching				
Personal Contact	NR	NR	NR	NR
Use of Time	NR	NR	NR	NR
Teaching Effectiveness	NR	NR	NR	NR

Table 16
Summary of Consistency Between Current Research and Previous Studies (Cont.)

Characteristics	Math HP	Comp.Sci. HA	English SP	Acct SA
Changes in Research				
Nature of Research	+	+	+	+
Financial Resources	+	+	+	+
Sources of Publications	+	+	+	+
Use of Technology	+	+	+	+
Changes in Service				
	NR	NR	NR	NR
Rewards in Teaching Evaluation				
Peer Evaluation	+	+	+	-
Student Evaluation	+	+	+	+
Rewards				
Department Support	+	-	+	+
Promotion	+	+	+	+
Salary Increase	+	+	+	+
Awards	+	+	+	+
Future Trends in Teaching				
Department Support	+	+	+	+
Working Conditions	+	+	+	+
Reward System	+	+	+	+
Motivational Factors	+	-	+	+
Don't Know	NR	NR	NR	NR
Rewards in Research Evaluation				
Publications	+	+	+	+
Grants	+	+	-	-
Conferences Participation	+	+	-	-

Table 16
Summary of Consistency Between Current Research and Previous Studies (Cont.)

Characteristics	Math HP	Comp.Sci. HA	English SP	Acct SA
Rewards				
Salary	+	+	+	+
Departmental Support	+	+	-	+
Low Teaching Load	+	-	+	+
Promotion and Tenure	+	+	+	+
Future Trends in Research				
Departmental Support	+	+	+	+
Reward	+	+	+	-
Reward in Service Evaluation				
Committee Membership	NR	NR	NR	NR
Don't Know	NR	NR	NR	NR
Rewards				
Money	+	+	+	+
Future Trends in Service				
Promotion	NR	NR	NR	NR
Less Paper Work	NR	NR	NR	NR

* + = Consistent with previous studies

** - = Inconsistent with previous studies

*** NR = Not related to previous studies

The results are also limited since they rely on tenured faculty perceptions, and do not consider untenured, or tenure-track faculty opinions. Such faculty might offer different responses related to the subject under study.

The results are also limited by the number of faculty in the four departments under study. The sample was small to analyzed results by academic rank (professors and associate professors). If the sample had been larger, differences by academic rank might have been revealed, but such analysis was beyond the scope of this study.

There was also a possible limitation because the selected departments carry high teaching loads, which may result in a greater focus on teaching activities than would have been found in other departments.

Additionally, the selected departments were grouped according to the Biglan model, which establishes differences in terms of paradigm, research modes, and pedagogy. It is possible that different responses might have emerged if a different model had been used. For example, assigning departments to clusters according to the amount of grants earned, the number of students enrolled, the number of faculty, the types of graduate programs, or the graduation rates of students, or assigning departments according to colleges (Arts Sciences, College of Engineering) might lead to very different results.

Faculty perceptions were not analyzed by different demographic characteristics. For example, previous studies have reported that faculty research, as measured by publication rates, varies between the most senior faculty and the most junior faculty, and that faculty productivity and creativity is both negatively and positively correlated to age

(Allison & Stewart, 1974; Bonzi & Day 1991; Cole, 1979a). The present results might have revealed different patterns had characteristics like sex, age, and ethnic background been considered .

This study was also limited because it did not consider how personal characteristics influence faculty commitment to teaching, research, and service activities. Fox (1992b) found that commitment to teaching was associated with low publication productivity, while research was associated with high rates of publication. It could be speculated that certain personal factors affect faculty time and commitment to teaching, or research activities.

This study was limited because it did not analyze variations between faculty dedication to teaching, research, and service as consequences of incentive policies and department procedures. Colbeck (1994) found the way faculty perceive policies and rules governing their work determine changes in faculty behavior and how they allocate their time. It could be that the faculty in this study perceive department policies and procedures as factors affecting their work.

Finally, this study was limited by the nationality of the researcher, whose native language was not English. While every attempt was made to minimize any language barriers, it is feasible that mistakes, or misunderstandings, in the translation and interpretation of results could have occurred.

Despite these limitations, this study provides valuable information to the body of

knowledge about the changes faculty perceive have occurred in teaching, research, and service activities in recent years. The results suggest some interesting implications for future research and practice.

Implications of the Study

The present study suggests several additional research efforts that might be conducted in the future. For example, since tenured faculty perceive that the recognition and reward system does not reflect faculty work, it might be beneficial for the institution to attempt to determine to what extent untenured faculty differ from tenured faculty. It would also be beneficial to explore differences in perceptions between tenure-track faculty with one or two years of experience, and tenure-track faculty with close to six years of experience. It is reasonable to suggest that faculty with less experience may perceive that they are able to excel in teaching, research, and service. With more experience, untenured faculty may realize their own limitations to a greater degree. Likewise, it might be beneficial to explore differences in perceptions between recently tenured faculty those tenured for a long time. It is reasonable to expect that faculty who have just received tenure have high expectations and feel highly motivated to work hard to reach higher academic ranks. With more years of tenure, faculty might perceive that institutional rules and procedures pose serious limitations to their work, rather than encouraging them to keep working.

It might be also beneficial for the institution to determine different perceptions about changes, sources of change, and future trends in teaching, research and service

between instructional faculty and research faculty, whose time commitments to different activities vary fairly dramatically.

It also might be interesting to explore faculty perceptions about what are the most necessary activities in which faculty should be involved. This might enable the academy to design reward systems that reflect that desired balance among institutional missions.

Another interesting research project could focus difference in attitudes and perceptions according to sex, age, and ethnic backgrounds.

Since the grouping of the departments within colleges varies from one institution to another, it might be beneficial to explore faculty perceptions with respect to the topic under study at other institutions to see if differences emerge.

In addition to the implications the present study poses for future research, the results also offer implications for future practices. Faculty suggestion for future administrative practices can be conceptualized in two areas: suggestions dependent upon the availability of new resources; and, suggestions that administrators may enact without significant new amounts of money.

If the institution receives more funding in the future, faculty suggest that salary increases, more teaching assistance, lighter teaching loads, and more travel money are important rewards for their work.

Faculty talked about the importance of individual rewards as incentives to improve their performance and support the goals and objectives of the institution. Some faculty suggest that raises are one of the most important rewards, and that they should be large

enough to justify additional faculty efforts. Faculty expressed that, in better economic conditions, administrators might award salary increases given the fact that faculty now spend more time in teaching, research, and service activities than before, and salary increases have been limited in recent years.

Many comments offered by faculty were related to the need for more teaching assistants and lighter teaching loads. Faculty perceive that changes in teaching activities like increased class size require more time (grading, advising), therefore research has decreased. Some faculty suggest that since the availability of support for teaching influences faculty work, more efforts should be made by the administrators of the institution to provide them with more teaching assistants, and lighter teaching loads to better assist faculty in what they teach.

At the same time, faculty suggest that while more assistants and lighter teaching loads are important factors to increase the quality of their work, release time to spend in teaching and research activities might be also considered by administrators as an important incentive for faculty.

Finally, travel money is considered by respondents as an important incentive to improve their work. Faculty suggest that among the things that the department should do to reward faculty is support them with more travel money for research. They reported that the lack of available money for travel is a severe constraint to the interchanges of ideas, as well as the diffusion of research results.

Since it is unlikely that the institution will have more available resources in the near future, however, the second group of recommendations, which do not involve a great deal of money, may be even more significant.

Many comments offered by respondents related to the inadequate mechanisms available to evaluate teaching. It is important for the institution and faculty to work together to identify better ways to evaluate teaching, and faculty offered some initial suggestions along that line. One suggestion was to use trained evaluators, or to use external referees from other universities who teach courses in the same area, to evaluate teaching. According to faculty, this approach allows administrators to evaluate the content of what is taught. To evaluate content and the relevance of what is taught, it is also suggested that the campus ask students 10 years after graduation to evaluate the extent to which their education contributed to their development. Finally, the use of portfolios is suggested by faculty as a supplemental tool to improve the evaluation of teaching. Faculty believe that administrators cannot reward something that is not measured. Without better ways to evaluate teaching, it is not possible to identify feasible ways to reward it, hence promote productivity in teaching.

Another suggestion relates to more flexibility in determining the responsibilities among teaching, research, and service activities, flexibility that considers faculty strengths and expertise in those areas. Some of the respondents suggested that administrators should assign faculty work load according to faculty expertise and inclinations. If faculty really want to teach, and they are very good at teaching, administrators should let them

ease the load of those who like to do more research. In other words, faculty who are excellent teachers, but not research experts, should teach, and be rewarded for that activity.

To provide faculty with more flexible schedules, enabling them to devote larger periods of time to research is another faculty suggestion. Faculty perceive that the way that time is distributed sometimes impedes them from having solid chunks of time to devote to research. Faculty suggest administrators might consider redesigning the schedule, so that teaching duties on Monday, Tuesday, and Wednesday are assigned, and Thursday and Friday are freed to devote to research. A parallel suggestion involves assigning all teaching responsibilities during a single semester, so that the second semester could be spent on research.

Prestige and reputation are important to both the institution and to faculty in attracting better students and more grant money. Faculty perceive that research is more prestigious than teaching. Given this, administrators may want to find a better way to evaluate and reward faculty prestige.

Motivation is another incentive for faculty. Some suggest that one way to increase productivity is to let people know that they are doing a good job. Even though, salary is an important reward, faculty expressed that teaching is not a monetary thing. What is important is to get psychic income, like a pat on the back, so that faculty psychologically feel good about themselves. Therefore, faculty suggest that administrators rather than criticize, should motivate faculty by recognizing them for what they do.

Faculty feel discouraged when they do not have ownership and control over what they do. Ownership is a more important reward than money, for some. Faculty express that one of the reasons they like research is because it is possible to have ownership of what they do. In contrast, in teaching and service, the administration works very autocratically and faculty do not have control. Therefore, faculty suggest that one way to increase productivity is to let them have influence, control and ownership for what they do. Otherwise, faculty will continue to see money as the primary motivation behind increased productivity.

Finally, faculty report changes in their activities: more teaching, less research, more service work associated with teaching activities, and more emphasis on applied research. Administrators may want to restructure rewards based on what faculty say they are doing, or offer rewards that motivate faculty to increase productivity in desired areas.

The results of the present study also suggest that faculty make one significant change in the academy. Faculty report that research is not only highly valued by administrators, but also highly valued by faculty. Decisions about promotion and tenure are made by faculty committees; Therefore, faculty suggest that changes in the reward system require substantial changes in the faculty values system, and that promotion and tenure committees ought to include faculty who value teaching and service, as well as research.

In conclusion, while the present study supports much of the previous research about the Biglan model, the results reveal some suggestions about changing the reward

system in the future that might lead to increased productivity. More important, not all those suggestions entail large infusions of new resources, something no likely to occur in the immediate future. Clearly, more research is needed to identify other ways to motivate faculty to increase productivity, but the present study offers some interesting initial results.

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APPENDIX A:
Sample Letter to Participants

2353 Olinger Rd
Blacksburg, VA 24060
Date

Dr.
Dept.
Virginia Tech
Blacksburg, VA 24060

Dear Dr.

I am a titular professor at the University of Zulia, Venezuela. I am currently enrolled in the Ph.D. program in Educational Leadership and Policy Studies at Virginia Tech and am in the process of my writing dissertation. My study relates to faculty perceptions regarding teaching, research, and service activities and how these activities are recognized and rewarded.

Four departments at this institutions were selected to be the focus of study in this research. From these four departments, your name was randomly selected and I am contacting you to see if you would be willing to participate. Participating in this study would entail a 60-70 minute interview at a time and place of your choice.

Although I will ask your permission to tape record the interview to facilitate the analysis, I can assure you that your confidentiality will be respected at all times. Any information reported in the results will be attributed to an alias.

The tapes will be transcribed with the help of an assistant. All names of participants will be eliminated before transcription, and all tapes and transcripts will be destroyed one year after completion of the study.

I have planned to finish this research by the end of August, 1996, when I have to return to work as a professor in my country. Therefore I would appreciate your collaboration and valuable participation in this research. I will contact you in the next several days to determine your willingness to participate. If so, I will ask you to sign the enclosed consent form and submit it to me at the time of the interview.

Sincerely yours,

Ph:951-0457
E-mail: Mhidalgo@vt.edu

Maria Portillo

APPENDIX B:
Participants Consent Form

Participant Consent Form

This research study is an exploration of faculty perceptions regarding recognition and rewards among teaching, research, and service activities and how they would like to be recognized and rewarded in the future. Participation in this study will consist of a single, one-hour interview. The setting and time of the interview will be arranged for your convenience.

The interview will be taped and transcribed. Only first names will be used in the transcription and pseudonyms will be used to report the results. Future written documentation and oral presentation (e.g., dissertation, journal articles, conference presentation) will also use pseudonyms. Identification such as place of work or address will be held confidential and will not be disclosed at any way. All conversations will be considered confidential, and all tapes and transcriptions will be destroyed one year after completion of the study.

I hope participation in the study will prove to be interesting and illuminating. If at any time, however, you feel uncomfortable, or change your mind about your participation, you are encouraged to pause, or cancel your participation. You have the right to withdraw any or all information provided by you during the interview.

My signature below indicates my willingness to participate in this project

Date: _____

Print name

Signature

APPENDIX C:
Interview Protocol

Interview Protocol Form

First Name: _____ Last Name: _____

Degree Obtained: _____ Area of Concentration: _____

Academic Rank: _____ Department: _____

Number of years at Virginia Tech _____ Number of years on faculty _____

Virginia Tech as first place of employment _____

Tenure Status _____ Tenure at previous institution _____

Other experiences: _____

Day/ Date of interview _____

Phone: _____ E-mail: _____

Sex: _____ Age: _____

Location: _____

Interview Questions:

1. How would you characterize your teaching activities?

PQ: When you think about your teaching activities, what do you think about?

2. Have your teaching activities changed in recent years? How?

PQ: Why did you change?

PQ: Have there been changes in class sizes?

PQ: Have there been changes in teaching load?

PQ: Have there been changes in student advising responsibilities?

PQ: Have there been changes in the use of technologies in instruction?

PQ: What are the latest trends in teaching in your discipline?

3. What prompted those changes?

PQ: What do you think were the causes of these changes?

PQ: Have you been encouraged to change by your department head?

PQ: Has your department been directed to change by your Dean or the Provost?

PQ: Do you see changes being promoted by your professional association?

PQ: Have these changes been promoted by external constituencies (e.g., alumni, parents, the business sector, or government agencies)?

PQ: Have you seen a shift at the national level in teaching related activities in your discipline?

PQ: Has your professional association changed its approach to teaching (e.g., emphasized it more or less, publicized it more or less) in recent years?

4. Considering the present conditions, what do you see as your future responsibilities in terms of teaching?

5. How would you characterize your research activities?

PQ: When you think about your research activities, what do you think about?

6. Have your research activities changed in recent years? How?

PQ: Have there been changes in the nature of your research (e.g., pure versus applied research)?

PQ: Have there been changes in the use of technology in your research?

PQ: Have there been changes in the kind of research being funded in your discipline?

PQ: Have there been changes in funding sources for your research (e.g., government sources versus private sector sources)?

PQ: Have you changed the amount of time you spend on research? If so, how and to what degree?

PQ: Have the sources where you can publicize your research results changed in recent years?

7. What prompted those changes?

PQ: What do you think were the causes of these changes?

PQ: Have you been encouraged to change by your department head?

PQ: Has your department been directed to change by your Dean or the Provost?

PQ: Do you see changes being promoted by your professional association?

PQ: Have these changes been promoted by external constituencies (e.g., alumni, parents, the business sector, and governments agencies)?

PQ: Have you seen a shift at the national level in research related activities in your discipline?

PQ: Has your professional association changed its approach to research (e.g., emphasized it more or less, publicized it more or less) in recent years?

8. Considering the present conditions, what do you see as your future responsibilities in terms of research?

9. How would you characterize your services activities?

PQ: When you think about your service activities, what do you think about?

10. Have your service activities changed in recent years? How?

PQ: Have there been changes in the nature of your service activities (e.g., more consulting in state, with private sector, etc.)?

PQ: Have there been changes in the use of technology in your service activities?

PQ: Have you changed the amount of time you spend on service related activities in recent years? If so, how and to what extent?

11. What prompted those changes?

PQ: What do you think were the causes of these changes?

PQ: Have you been directed to change by your department head?

PQ: Has your department been directed to change by your Dean or the Provost?

PQ: Do you see changes being promoted by your professional association?

PQ: Have these changes been promoted by external constituencies (e.g., alumni, parents, the business sector, or government agencies)?

PQ: Have you seen a shift at the national level in service related activities in your discipline?

PQ: Has your professional association changed its approach to service (e.g., emphasized it more or less, publicized it more or less) in recent years?

12. Considering the present conditions, what do you see as your future responsibilities in terms of service?

13. In what ways is teaching valued or rewarded in your department?

PQ: Has this changed in recent years? How?

PQ: What kind of things are evaluated in teaching at your department?

14. In what ways is research valued or rewarded in your department?

PQ: Has this changed in recent years? How?

PQ: What kind of things are evaluated in research at your department?

15. In what ways is service valued or rewarded in your department?

PQ: Has this changed in recent years? How?

PQ: What kind of things are evaluated in research at your department?

16. In what ways would you like to be rewarded in the future for your teaching activities?

PQ: What could your department or this institution do to better recognize your teaching efforts?

PQ: Is your professional association making efforts to recognize/reward teaching? How?

17. In what ways would you like to be rewarded in the future for your research activities?

PQ: What could your department or this institution do to better recognize your research efforts?

PQ: Is your professional association making efforts to recognize/reward research? How?

18. In what ways would you like to be rewarded in the future for your service activities?

PQ: What could your department or this institution do to better recognize your service efforts?

PQ: Is your professional association making efforts to recognize/reward service? How?

19. Are there other issues that have not been mentioned and you might consider relevant to this discussion?

APPENDIX D:
Contact Summary Form

Contact Summary Form

Respondent: _____

Date: _____

1. Summary of the information obtained about each of the interview questions?
2. What were the themes most frequently mentioned in this interview?
3. Anything else that was considered salient, important, illuminating, or unique in this interview.
4. What new prompt questions can be included in the next interviews?

VITA

Maria Hidalgo De Portillo

2353 Olinger Rd

Blacksburg Virginia 24060

(703) 951-0457

Academic Background

Ph.D. Educational Administration.

Virginia Polytechnic Institute & State

University, Blacksburg, Virginia. Expected date of graduation: Summer, 1996

M.A. History of Science.

University of Oklahoma, Norman, Oklahoma

1984

BA. Education: Biology and Chemistry.

University of Zulia. Maracaibo, Venezuela.

1973

Experience

- Titular Professor at the University of Zulia, Maracaibo-Venezuela. (1973 to the present).
- Teaching at undergraduate level in Current Problems of Science and Technology
- Teaching at undergraduate level in Problems of Science and Technology in Underdeveloped Countries.
- Teaching at graduate level in a Master's program in Management and Planning of Science and Technology.
- Director of the Master's Program in Management and Planning of Science and Technology.
- Temporary Director of the Graduate Division of the Facultad Experimental de Ciencias.

Areas of Expertise

- History of Science
- Science and Technology in underdeveloped countries
- Research Administration
- Organizational Development

Publications

The Institute Pasteur in Maracaibo at the end of 19th century. In The Scientific Institutions in Venezuela. Acta Científica. Caracas-Venezuela. 1988.

The importance of a Master program in Management and Planning of Science and Technology in a underdeveloped context. OPTION. Maracaibo, Venezuela.

Science as a social construct in ancient times. OPTION. Universidad del Zulia. Maracaibo, Venezuela.

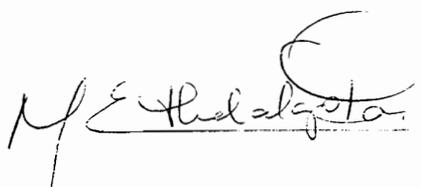
Academic Honors

Andres Bello. Merit of Work. University of Zulia. 1990.

Professional Membership

Venezuelan Association of University Professors.

Latin-American History of Science Society

A handwritten signature in black ink, appearing to read "M. E. Huelalgotar". The signature is written in a cursive style with a large, stylized initial "M" and "E".