Organizational citizenship behaviors and technologically proficient university faculty

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ORGANIZATIONAL CITIZENSHIP BEHAVIORS AND TECHNOLOGICALLY PROFICIENT UNIVERSITY FACULTY

A Dissertation

Presented to the Faculty of the School of Education
The College of William and Mary in Virginia

In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

by
Scott Richard Sechrist
July 2000
ORGANIZATIONAL CITIZENSHIP BEHAVIORS AND TECHNOLOGICALLY
PROFICIENT FACULTY

by

Scott Richard Sechrist

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This dissertation is dedicated to my wife, Joan
and to my sons
Matthew and Mark
who supported me throughout my graduate education,
and to my parents
Richard and Bonnie Sechrist
who instilled in me the importance of education.
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Abstract

ORGANIZATIONAL CITIZENSHIP BEHAVIORS AND TECHNOLOGICALLY PROFICIENT FACULTY


As institutions of higher education seek to meet the demands of a changing technological environment, they are compelled to push for increased faculty use of technology in their instructional and scholarly pursuits. As more faculties adopt these innovations, universities find themselves unable to provide the necessary technological support required. Filling this support gap are the techno-profs, faculty members who are technologically proficient, have a network of technological resources, reside at the department level, and are willing to assist most everyone who asks for help.

The purpose of this study was to determine if the techno-profs within various university administrative units have common social and personal characteristics, provide similar technological contributions to their units, exhibit characteristic organizational citizenship behaviors (OCB), and experience positive or negative effects on their careers as a result of these discretionary behaviors.

Social network analysis of the results of a World Wide Web based survey of two academic departments at two universities in the southeastern United States revealed three techno-profs to whom other faculty went for assistance. Semi-directed interviews of the three techno-profs, their deans, and the information technology administrators at both
institutions were conducted using a conceptual framework of the university as a social organization based upon the works of Goran Ahme (1994) and Shirley, Peters, & El-Ansary (1976).

It was concluded that by relying so heavily on techno-profs to provide technological expertise and by providing them the most advanced technological resources, organizations, in essence maintain these faculty in a position that benefits the institution, but is often detrimental to the individual. Techno-profs can easily attribute an exaggerated worth to their technological abilities and importance to the organization as the university pays little heed to their contributions at promotion and tenure time.

Further research is needed to evaluate the effects of OCB on faculty in disciplines other than Humanities, and at different points along the faculty career path. A study of the financial impact of OCB is also needed.
ORGANIZATIONAL CITIZENSHIP BEHAVIORS AND TECHNOLOGICALLY PROFICIENT UNIVERSITY FACULTY
CHAPTER 1
INTRODUCTION

No single issue stands poised to affect the whole of American higher education as does the impact of information technology (IT). From 1980 to 1995, higher education invested approximately $76 billion in information technology goods and services with about $21 billion of that amount spent to support teaching and learning (Geoghegan, 1994). Despite this monetary outlay and the wealth of data that suggests that teaching with technology is an efficacious means by which to offer collegiate instruction, faculty integration of technology in the curriculum has been slow to develop. This "slow revolution", however, has begun to speed up. Estimates of faculty use of technology in their offices and classrooms has increased from 5% in 1994 to more recently about 15-16% (Green, 1996a). The impetus for faculty to adopt technology comes from several quarters: it is available, successful integration by their peers is evident, and administrative pressure to offer alternative delivery systems or enhanced learning activities is increasing (Smith, 1997).

The term technology invokes various meanings depending upon the situation, the institution, or the expectations of those defining the term. What is considered "basic technology" at one institution may be "cutting edge" at another. Technology runs the gamut from the desktop computer to the supercomputer and access to email, to presentation software, multimedia software applications, and the Internet. Comparative
data between the 1994 and 1997 Campus Computing Projects demonstrate the rapidly growing use of information technology in instruction (Green 1997). The use of e-mail in instruction rose from 8% to 33%, Internet use rose from 11 to 25%, presentation software use rose from 15% to 33%, while the use of computer simulations remained steady at 14% over the 4 year period. Students often enter college computer literate, and many expect the inclusion of technology in their on campus courses. U.S. Census data (1994) indicated that the number of households with a computer rose from 8.2% in 1984 to 22.8% in 1993. The same report revealed that access to a computer at school for students aged 3 - 17 rose from 28% to nearly 61% during that same period.

The infusion of technology has removed the focus from the faculty member as the sole source of information as students now have access to millions of pages of text, graphics, sounds and videos literally at their fingertips. The faculty role has expanded to include that of "knowledge navigator" as faculty assist students to access, evaluate and critically examine the information available electronically (Dolence & Norris, 1995).

Technology has also enabled colleges to draw upon innovative student markets and increase course offerings, technology offers faculty new ways to teach and students, new ways to learn (Smith, 1997; Batson & Bass, 1996; Gilbert, 1996b).

Faculty Use of Technology

Academic administrators increasingly view IT as a means to improve institutional productivity, to extend access to higher education via distant, asynchronous learning, and as a catalyst in the quest to improve teaching and learning (Gilbert, 1996a). New technologies can remove the traditional responsibilities from the individual faculty
member such as: new multimedia software that has advanced to the point that it can replace face-to-face lectures. Asynchronous learning networks that can create lecture teams of world-renowned experts on the WWW, and examinations that can be administered and graded via national test banks (Young, 1997). Some of the traditional tasks of the professor: as course designer, deciding what information is to be included or excluded in a course, grading exams and tests, lecturing can now be performed via new technologies. This "unbundling" or dividing up of professors' tasks by technology is both viewed as a welcome technological boon and as a threat to the very core of the academic system, and to the functions professors play in higher education.

Teaching with technology can reduce the amount of personal contact between faculty and students, and if not carefully employed, can eliminate discourse and interaction altogether. The role of the professor has traditionally involved providing students with the knowledge and skills necessary to filter large amounts of information into meaningful concepts and ideas. The advent of the World Wide Web (WWW) has made access to even greater amounts of information (with an even wider range of quality) available to students, making it even more important that students be able to "separate the wheat from the chaff". In order to employ these new technologies, faculty must be knowledgeable about or be competent with new hardware, operating systems, networking, software, the Internet/WWW, and multimedia systems. While some professorial tasks have been removed, new ones have arisen: programmer, computer course designer, web engineer, television instructor, chat room moderator. The role of the professor is evolving from one of the "sage on the stage" to a "guide on the side"
Myriad obstacles face even the most technologically innovative faculty member who wishes to incorporate IT into an instructional plan. Uneven and limited existence of and access to technological resources, fragmented support services, poor or non-existent training, and a lack of good instructional usage models, all make the incorporation of IT a daunting task. Karen Smith, director of the Faculty Center for Teaching and Learning (FTCL) at the University of Central Florida, has identified three major obstacles to faculty and adoption and integration of technology; a lack of time to learn the new technology; a lack of access to the technology, and the dominance of a promotion and tenure system that accepts and rewards teaching excellence in general, and the utilization of technological innovation specifically (Smith, 1997). Junior faculty, in particular tend to possess the greatest technological proficiency, but are most vulnerable in a system that does not reward those skills (Smith, 1997, Gilbert, 1996b). It is perplexing then, that colleges and universities in general, are typically enthusiastic about the inclusion of information technology within higher education, yet as Ken Green points out

"While eager to see more and better use of technology in instruction, comparatively few [12.2%] provide recognition or reward for faculty efforts to do so. The vast majority of campuses are sending clear, if somewhat punitive message to faculty: do more with technology, but learn the skills on your own time and do it in addition to your other professional responsibilities."

One might expect that faculty would seek and receive help from the existing computer and instructional design support services, however, these systems are ill-
equipped to accommodate large numbers of faculty seeking assistance. As the number of faculty using technology has increased (Green, 1997), the numbers of support staff has not kept pace, with the average number of full-time equivalent (FTE) support staff at public universities is 82 and at four year public colleges the average FTE support staff number 62. Private four year institutions average only 50 FTE support staff to assist technology users (Green, 1997).

The support service crisis results from a lack of funding for new positions, the loss of qualified personnel to outside industry (often at twice the salary), the expansion of services to accommodate new technologies and instructional uses, and the general increase in the number of faculty desiring to use information technology in their instruction (Gilbert, 1997). So, in the midst of an inadequate support structure, how and where do faculty learn about information technology and its uses in higher education? To whom do they ask the day-to-day questions about software and hardware?

As with the diffusion of any new idea, concept or practice, the faculty who have made the effort to incorporate information technology are referred to as the innovators and early adopters (Rogers, 1983). These individuals, however, make up no more than 15% of an existing social system (Rogers, 1995). In the mid to late 1980s, a chasm existed between these early adopters and the more mainstream faculty (Moore, 1991; Geoghegan, 1994). However, with the growth of personal computers and the Internet, Gilbert and Green believe that chasm was crossed in 1995 and in that year the use of information technology finally broke beyond the domains of innovators and early adopters and entered the ranks of the mainstream faculty (Gilbert, 1996; Green, 1996).
A recent on-line discussion group referred to the increased use of technology by mainstream faculty as "bridging the gap" (Rodwell, 1997).

As the use of technology expands, the need for experts to assist faculty in its adoption and use becomes imperative. If support services do not expand to pick up the increased demand for training and assistance, faculty must increasingly rely on their peers and colleagues. But to whom do the faculty go? In the faculty work environment, someone is usually identified as the "go-to" person when one has a computer or technology problem, question or issue. Often referred to as the "alpha-geek," I prefer to employ the term techno-prof to distinguish that faculty member who has been identified by the group as the technically proficient person to whom one goes for specific technological questions. Techno-profs often provide this assistance as part of their prosocial, collegial or discretionary behaviors. These discretionary generalized helping behaviors in the work-place have been identified as Organizational Citizenship Behavior (OCB) by Organ (1985).

Katz and Kahn (1978) distinguish between in-role and extra-role behavior when describing organizational behaviors. In-role behaviors are those that an individual performs because they are part of the defined positional responsibilities and duties. In-role behaviors, they postulate, are performed in return for extrinsic rewards. Extra-role behaviors or voluntary actions, are those activities performed above and beyond those required. They provide intrinsic rewards, especially feelings of good citizenship with respect to the organization.

OCB is defined as individual voluntary behavior that in the aggregate aids
organizational effectiveness but is neither a requirement of the individual's job nor directly rewarded by the formal system. Researchers describing OCB find it difficult to demonstrate that organizational members are able to discriminate between extra role and in-role behaviors. Graham found in her study (1986) that she could not reliably discriminate between OCB and activities that are generally regarded as "professionalism". But what impact does being the techno-prof have on this individual? What characteristics best describe this person? Does being the techno-prof enhance or sacrifice his/her academic career?

Statement of the Problem

The diffusion of technological innovation within higher education is an evolving and complex process. Colleges and universities administrators have spent considerable time and effort over the last five years addressing issues related to the technical infrastructure needed to network and "wire" their institutions to meet a growing and rapidly changing demand for on line courses. One the other hand, one of the largest issues to arise from the steady march of technology through higher education is the lack of faculty support. In the 1997 Campus Computing Survey, Green notes, that "assisting faculty to integrate technology into instruction" and "providing user support" are the two most important information technology issues facing colleges today. As the integration and use of technology in higher education grows and mainstream members of the faculty begin to adopt and use technology in their teaching, research and communications, to whom will they turn for assistance in the presence of an inadequate support system?

Steven Gilbert (1997a) of AAHE notes that the 1980s model of computing support, in
which the technical staff and the large central mainframe computer system typically resided in the same building is woefully inadequate for current networked systems of powerful PC's and mediated classrooms. Institutional budgeting for technical support staff has not kept pace with the demand created by the requirements to constantly upgrade hardware, software, and operating systems. The concomitant demand by faculty for instructional design support and training is also increasing proportionately each year.

At California Lutheran University a program has been adopted whereby technically proficient faculty, acting as experts or faculty mentors, to assist the mainstream faculty to adopt technology. The directors of this program indicated that non-technical faculty were more likely to respond to assistance from a colleague, prefer a one-on-one mentor-mentee format, and that faculty preferred learning in their own offices (Pflueger, 1995).

The *techno-prof* is a poorly understood, rarely studied individual who appears to exist in every department or organizational unit. Within the academic setting, a departmental techno-prof might be a technically-savvy faculty member. Thus, the term “techno-prof” has two meanings: technically proficient and technological professor. Two questions drive this research. First, what are the characteristic behaviors of these individuals? Second, what effect does being the techno-prof have upon the individual’s academic career?

The problem of this study is to determine if the technologically proficient faculty (techno-profs) within various university administrative units have common social and personal characteristics, provide similar technological contributions to their units, exhibit
characteristic organizational citizenship behaviors (OCB), and experience positive or negative effects on their careers as a result of these discretionary behaviors.

Research Questions

Organizational citizenship behaviors exhibited by technically proficient faculty members and the effect of these behaviors upon the techno-profs provide the conceptual framework for this study. The research questions guiding this study are:

1. Who are the technically proficient faculty members in higher education?
2. What are the employment and personal characteristics of the techno-profs?
3. What do techno-profs do? What portion of their actions involve assistance with:
   A. Hardware questions/problems
   B. Software questions/problems
   C. Software application/usage issues
   D. Unit planning and policy questions
   E. Specialized trouble-shooting
4. Are the activities they provide discretionary or part of their faculty role?
5. Are they rewarded for their activities?
6. Who do the techno-profs help?
   A. Which of their behaviors are individually oriented?
   B. Which are directed towards the organization?
7. What effects does being the techno-prof have upon their career?
   Does being the techno-prof enhance or jeopardize an academic career path, promotion and tenure?
Purpose of the Study

Given the changing role of the professorate with regards to technology, the results of this study can provide assistance to academic administrators (provosts, deans and chairs) in identifying technically proficient faculty members, provide insight as to what organizational citizenship behaviors they exhibit, and give insight as to how institutions might recognize the contributions these faculty make. For the technically proficient faculty member, the results of this study can provide insight as to what aspects of being the techno-prof enhance, and which aspects can detract, from the academic career path.

Results of this research can provide assistance to college deans and chairs as to the characteristics of the citizenship behaviors that technically proficient faculty make to the effectiveness of their respective organizations.

Research is needed in determining exactly what citizenship behaviors technically proficient faculty provide, for whom and why they provide these voluntary contributions.

Limitations

The study is limited by the number of respondents to the initial on line survey. Thirteen of thirty three (39.4%) faculty responded to the on-line social network survey from the Humanities department at Coastal University and 21 of 46 faculty (45.7%) of the faculty in the Language Department at Inland university responded. Since not all faculty in either department responded it is possible that not all of the existing techno-profs were identified in either department. Non-respondents may not go to other faculty members to obtain technological assistance, may have chosen a different faculty member to go to, or may use existing computer support services. The study was limited by access
to universities within driving distance of the investigator due to time and financial constraints. Since a variety of institutions across several Carnegie Classification types are available within that geographic area, it was possible to delimit the type of doctorate-granting universities. Happily, the Provosts at the two desired locations accepted my invitation.

**Delimitations**

The purpose of the network analysis was to identify any techno-profs which exist in the two departments under scrutiny, and the study was delimited to the three faculty members who were identified, the deans of the Colleges which housed the techno-profs and the information technology administrators at both institutions.

The study was delimited to two institutions and to two departments of similar size and faculty mix. By choosing departments having a similar size, the number of techno-profs identified should be similar and selecting from departments with a similar mix of faculty titles provided an opportunity for the identification of techno-profs who might be at any point along the faculty career continuum (from instructor to full professor). The study was limited to three techno-profs since the network analysis of one department (Coastal University) revealed two different faculty members as providing technological assistance to their colleagues. In the other department, one clearly identified techno-prof emerged from the sociogram. The study was further delimited to include two chief technology administrators and two deans at each of the institutions where the techno-profs are employed to determine the extent to which the behaviors of the techno-profs are recognized and rewarded since the deans are intimately involved in the review, promotion.
and tenure process and the IT Administrators would be familiar with the general
diffusion, culture, and use of technology at their institution.

Definition of Terms

**Techno-prof**

A faculty member who has achieved a level of technological proficiency such that
he/she becomes a source of knowledge, advice, and expert opinion for other members of
his academic unit. The individual is actively sought out by his colleagues for
assistance regarding technological problems and for guidance and instruction concerning
computers and technology.

**Information Technology**

Any equipment or interconnected system of equipment that is used in the
acquisition, storage, manipulation, management, movement, control, display, switching,
interchange, transmission, or reception of data or information by humans.

**Instructional use of technology (Educational Technology)**

The Association of Educational Communications and Technology provides a
broad definition of the term ‘educational technology’ as – "the theory and practice of
design, development, utilization, management and evaluation of processes and resources
for learning." (Ely, 1997). For this case study, however, the instructional use of
technology is defined as the use of information technology resources for pedagogical
purposes.

**Organizational Citizenship Behavior (OCB)**

Organizational citizenship behavior (OCB) represents individual behavior that is
discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization.” (Organ, 1988, p. 4).

**Organizational Citizenship Behavior- Individual (OCBI)**

Organizational citizenship behaviors that are directed towards a specific individual. (Williams & Anderson, 1991; Organ, 1997).

**Organizational Citizenship Behavior- Organizational (OCBO)**

Citizenship behaviors which “offer no immediate aid to any specific person or persons” (Organ, 1997), but is directed towards the organization or unit as the target. Organ (1997) prefers to label this dimension of OCB as conscientiousness.

**Hardware**

The physical equipment (computers, peripherals, printers, scanners, networks, etc.) associated with instructional technology (Shepherd, 1998, p. 314).

**Software**

The programming that controls computing technology including operating systems and applications -- word processing, database, presentation, communication and various proprietary programs (Shepherd, 1998, p. 321).

**Computing Support Structure**

For this study, ‘computing support structure’ is defined as the institutional systems, policies and procedures designed to assist faculty in the purchase, installation, troubleshooting and use of computing technology.
CHAPTER 2
REVIEW OF THE LITERATURE

Technology and Higher Education

The transformation of academe by its incorporation of computing has turned out to be more of an evolutionary process than a revolutionary one. A quarter of a century ago, Roger Levien (1972) predicted that the use of computers across the curriculum would increase, that computer science degree programs would proliferate, and that the reach of higher education would extend beyond the traditional campus. It has taken twenty-five years for his projections to take hold. Computing has evolved into information technology (IT), a broader term that encompasses the means by which learners and instructors acquire, process, store, analyze and disseminate information (Russell, 1997). Data from the recently published Seventh Campus Computing Survey (Green, 1997) indicate gains in the numbers of faculty and institutions using information technology as an instructional resource. Instructional uses of information technology include the incorporation of the Internet, electronic mail, computer simulations, presentation software, commercial software, interactive multimedia, learner-based instructional programs and computerized classrooms within the curriculum (Green, 1997).

Faculty use of information technology has begun to move beyond the offices of
the innovators and early adopters into those of the mainstream faculty teach, do research, and conduct their daily professional business (Gilbert, 1996b; Green, 1997). Faculty who have had, even in the recent past, had little interest in using information technology, now see the utility of e-mail as an easy and effective means with which to communicate with students and colleagues. The information-rich World Wide Web (WWW) offers relatively easy access to a storehouse of information online. As interest in distance and asynchronous learning networks has increased, the computer and the WWW offer media through which to offer instruction independent of time and place. Steve Gilbert (1996b), director of technology projects for the American Association of Higher Education, believes that the turning point for the diffusion of Information Technology occurred in 1995 when the numbers of faculty and student using e-mail rapidly expanded across college campuses. He foresees the next decade as the critical period when the advanced use of information technology will move from the domain of the early adopters and spread to mainstream faculty.

The power of information technology to transform higher education is becoming more evident as new technologies for collaborative, active learning are introduced. The key to the successful diffusion of information technology will be the determination of the right combination of face-to-face and electronic communications, coupled with an effective balance of independent learning and instructor guidance in the courses offered. The potential exists to fundamentally change the way many faculty execute a large portion of institutions' missions, namely teaching (Batson and Bass, 1996). The utilization of technology in teaching has enabled many faculty to realize an
epistemological shift in the traditional teaching/learning paradigm as the print culture shifts to a digital culture. The digital domain requires students to become more involved in their learning (not less, as many critics warned), as knowledge creation becomes a collaborative, active, ongoing process (Batson & Bass, 1996).

Michael Dolence and Donald Morris (1995) in the work Transforming Higher Education: A Vision for Learning in the 21st Century envision dramatically realigned, redesigned organizations in higher education in which faculty roles have been redefined to accommodate and take advantage of information technology. They see the faculty role as both expanding from the traditional teacher/researcher roles to include synthesizer, certifier of mastery, mentor, evaluator, architect, and navigator, but they also envision that these roles need not be embodied by every faculty member. The marketplace, they propose, will demand different mixes of these roles to be exhibited by faculty and institutions.

Steven Gilbert (1996b) sees multiple obstacles to improving teaching and learning with information technology. Gilbert feels that fragmented institutional planning that focuses only on obtaining the latest technology, but not on teaching and learning, coupled with poor communication between faculty, administration, and computing staff concerning the technology plans that do exist has lead to distrust and a fear that faculty jobs will be lost. If faculty are not involved from the beginning of any technological planning, implementation will be impeded. Legal questions concerning intellectual property and fair use issues in technology are complex and confusing. Faculty often fear using technology for fear of breaking one or more copyright or fair use laws. Obtaining
legal rights to use video, audio and images is time-consuming and difficult and may reduce the use technology by wider numbers of faculty. Another barrier as seen by Gilbert (1996b) is that there are a lack of “good practices” available for faculty to learn how to model or pattern their own instruction after.

Lastly, Gilbert (1996b) posits four other obstacles to improving teaching and learning with information technology, and they are essentially issues which speak directly to faculty adoption and use of technology. He notes that institutions tend to underestimate the difficulty of faculty adoption of new technologies. To get faculty to adopt, create and employ new teaching methods based upon information technology involves a major change in the use of an individual faculty members time and effort. Fragmented, uneven support services for both students and faculty may frustrate even the most willing participants who wish to use information technology in their courses. Lastly, Gilbert (1996b) feels that faculty reward systems that pay little or no attention to the effort involved in the adoption of technology for instruction, that faculty typically encounter promotion and tenure systems that do not recognize work published electronically, nor have any means by which to evaluate the quality of new educational applications of technology produced by faculty as part of the peer-review process.

Despite these obstacles, the use of technology by faculty is increasing. The early adopters have overcome many of the barriers to incorporate technology in their academic lives. Larry Johnson, associate director of the League for Innovation in the Community College believes that e-mail may have been the technological application in the early 1990s that provided the compelling rationale to adopt technology for mainstream faculty
Green, 1996a). Now that most faculty have computers, 50% across academe, 100% at
many institutions, (Green, 1996a), other uses of technology may well follow as faculty
learn what other applications that technology can be used for in teaching and learning.
The diffusion of technology has recently begun to spread beyond the early adopters in to
the mainstream faculty (Green, 1996a).

**Diffusion of Technology**

*Diffusion* is the process by which an innovation is communicated through social
channels over time among members of a social system. The four main elements in the
process of the diffusion of an innovation, then are: 1) the *innovation* itself - the new idea,
2) a means of *communication*, or channels through which individuals and/or groups share
information, 3) a length of *time*, a rate of adoption of an innovation and 4) a *social
system* - the set or group of interrelated units engaged in joint problem solving to
accomplish a common goal. Adopter distributions over time form an S-shaped curve
and approach normality. (Rogers, 1995). Adopter categories can be partitioned based
upon the degree of innovativeness (earliness of adoption of the innovation) into five
major categories: first, a small, but important group of *Innovators* (2.5%), followed by the
*Early Adopters* (13.5%), a group essential to the further diffusion of the innovation. The
next two major categories form the bulk of the individuals of the social system (the
"mainstream members") and are divided into the *Early Majority* (34%) and the *Late
Majority* (34%), the "mainstream" of the social system into which the innovation is
introduced. The final category are the *Laggards* (16%), those individuals who actually
resist adoption of the innovation.
When sufficient early adopters have embraced and employ the innovation and have subsequently begun to influence the decisions of the Early Majority, a "critical mass", or 50% of the individuals within the system has been reached. At this point the diffusion of the innovation becomes self-sustaining and the innovation spreads throughout the remaining members of the system (Rogers, 1995).

Studies of diffusion of technological innovation in higher education have generally explored the specific factors, perceptions, motivations, or barriers that play a role in faculty adoption or non-adoption of technology. Morehouse, & Stockdill (1991) in a three year study of 61 faculty and staff, identified electronic characteristics (superiority, compatibility, cost-effectiveness and complexity) and institutional components (access to resources, availability of technical expertise, and rewards for innovation) as factors that inhibit or promote technologic adoption on a campus. Edwards (1997) used the CBAM (Concerns Based Adoption model) to survey 338 faculty in a medium sized college in North Carolina and her work suggested that generally faculty used computers for personal use, but were pessimistic about the use of computers in the curriculum.

Faculty who use computers instructionally are more likely to own a computer outside of work, and hence have more microcomputer experience (Spotts & Bowman, 1995). Furthermore, faculty who adopt technology are also more likely to have had training in computer usage, generally in the form of personal, non-formal, independent study (Scott, 1986). However, merely having an early adopter in the social system does not ensure the diffusion of the innovation. The difficulties in getting other faculty
members to accept and adopt technology as an integral part of the educational process are numerous and foreboding. Limited resources, uneven access to hardware, software, and support services make it difficult for many faculty to attempt to explore the uses of instructional technology. Rarely do the support services at institutions (librarians, instructional technologists, faculty development specialists) coordinate their efforts successfully enough to provide adequate support for faculty seeking to develop and employ instructional technologies (Gilbert, 1996b). Poor communication between administration, faculty, and computer services staff can lead to mistrust during times of fiscal shortfalls. In the presence of tightening budgets, many faculty, fearing the worst, assume that the use of instructional technologies is part of institutional plans to reduce faculty positions or reallocate existing funds away from "traditional teaching" (Gilbert, 1996b). A major barrier to faculty adoption is the lack of sharing of experiences between faculty who use and those who do not use information technology (Gilbert 1996b).

The members of the social system contribute to the adoption of instructional technology in higher education in very significant ways. The adoption and diffusion of innovations within a college or university is influenced in large part by the social climate of the institution itself. While some universities foster creativity and have built in channels for the introduction and diffusion of new ideas and concepts and methods, others encourage a more reflective pattern of traditional teaching and learning and research (Evans, 1968).

For most institutions, despite their particular inclination towards technologic innovation, there exist individuals who will adopt the new idea or method at an early
stage. For the institutions who actively seek to introduce and diffuse an innovation, a change agent is often employed usually in the role of director of Academic Technologies, Instructional Specialist, Information Technologist. The two major players in the diffusion model, then, include the change agent and the opinion leader. The change agent is typically the person (or persons) who wish to influence a clients' decision to adopt an innovation deemed desirable by the change agent. The opinion leaders, on the other hand are typically the innovators and early adopters of innovation within the system (Rogers, 1983, 1995). Although not their primary function, they often influence non-adopters to try an innovation. Change agents employ opinion leaders to assist in the diffusion of innovation within the system (Rogers, 1995). Opinion leaders are sought out because within the context of the academy, they tend to be homophilous with the remaining faculty (similar in age, education and status, personality). These opinion leaders are not too far ahead of the average individual within the social system, and by being homophilous with the mainstream group, are more likely to achieve effective communication about the innovation (Rogers, 1995). Since the early adopters have the greatest degree of opinion leadership in most social systems, faculty who have adopted a particular technologic innovation wield a large amount of influence with their colleagues (Rogers, 1995).

The importance of faculty-to-faculty influence with regards to the adoption of instructional technology cannot be underestimated (Gilbert, 1995b). Gilbert suggests the use of early adopter faculty as peer mentors as a means to increase the quality and availability of support services (Gilbert, 1996b). Ostensibly these technically proficient
faculty members (techno-faculty) would receive stipends or release time as a reward for their mentoring. Gilbert is honest in his appraisal that "...if these faculty are untenured, the benefits of being a mentor are not so obvious, and the time required can jeopardize career progress" (Gilbert, 1996, p. 21).

The effects of being a peer mentor on the careers of the *techno-profs* is not understood. Research on novice to expert education in nursing emphasizes the positive impact that experts in nursing can make upon the development of the novice and beginner nursing staff (Benner, 1984). But are the techno-faculty truly "experts" in the sense that Benner describes? With the rapidity of change inherent in computing technology, it becomes quite difficult to remain "expert" for very long. Benner, basing her descriptions on Dreyfus' Model of Skill Acquisition, notes that the acquisition of a skill goes through five proficiency levels; novice, advanced beginner, competent, proficient, and expert (Benner, 1984). As the early adopters have embraced technology and are currently using it, they become the "expert" within the departmental or organizational setting. The less technically proficient, the "novices and beginners" seek out the departmental expert with questions and calls for assistance whenever a technological problem arises. The *techno-prof* renders assistance not as part of their duties as a faculty member, but as a voluntary, discretionary behaviors -- citizenship behaviors.

**Organizational Citizenship Behavior**

Ernest Boyer, in *Scholarship Reconsidered*, (1990) traces the shifting priorities of the professorate from teaching to practical service work to it's current research focus. A stronger emphasis on undergraduate teaching has also emerged in the last few years at
many institutions. Boyer noted in 1990 that

“American education has never been static. For more than 350 years, it has shaped its programs in response to the changing social context. As we look at today’s world, with its disturbingly complicated problems, higher learning, we conclude, must, once again, adapt . . . a new vision of scholarship is required.” (p. 81)

In light of the recent changes to higher education as a result of the advances in information and computer technology. Faculty must not only master and stay current in their disciplinary knowledge and skills but must increasingly be more technologically proficient. If a faculty member is to employ technology into his courses he must first learn the technology well enough to master it and then to employ it effectively. For some, this steep learning curve has been a difficult obstacle to overcome. Faculty time is typically at a premium, so faculty either learn the software and hardware on their own time, or not at all. Courses are available to faculty available, but not always offered at convenient times or not at the level necessary to gain competence. To whom can the faculty turn to learn the new technology? In the information technology culture, the “alpha geek” is the person in one’s work group who is the most knowledgeable technical person around. The early adopters and “techies” in a department are often the opinion leaders to whom the mainstream, non-technology employing faculty can turn to learn about the latest technology and how it can be used in academe. Jane Marcus, director of the Information Technology Systems & Services of Stanford University tested a model of innovative technology adoption by individual faculty described by the following formula:
A = f[R, PV, C] (Gilbert, 1995a). In Marcus' model, the faculty member's decision to adopt, (A) was a function of the resources available (R), the perceived value of the innovation (PV), and whether the faculty member communicates (C) with other adopters (Gilbert, 1995a.) It is this communication with other adopters that is the focus of this study. The less technically proficient go to the techno-profs for advice, assistance, and guidance in areas technologic. By virtue of their technological prowess, the techno-profs become the source of assistance for others even though it is generally not part of their job role.

Joseph Ransdell of Texas Tech University stated that "however suspicious they may be of their early adopting colleagues, they are far more open to influence from people who share with them a common interest in, and understanding of their professional subject matter" (Gilbert, 1995a, p. 37).

An exclusive emphasis upon doing exactly what is expected within one's job description fails to take into account those informal, pro-social, helping behaviors that benefit an institution (Katz, 1964). Katz (1964) notes that no organization can foresee all of the contingencies which occur during its operations and that innovative, spontaneous actions of those who work within the organization are vital to organizational effectiveness and survival.

Organ (1988) defines organizational citizenship behavior (OCB) as those individual behaviors that are discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization. In an organization like a college or university, a multitude of individuals work together to make the organization effective. That universities have multiple goals
and a wide range of interests and constituencies, often with broadly defined mission statements make it difficult to assess exactly how effective the institution has been. Faculty, in particular, have broadly defined work roles, and are typically assessed on the traditional areas of teaching, service and research. Often they are expected to be "effective" teachers or "excellent" researchers yet no guidelines or criteria are specified to accompany these ratings.

Skarlicki (1995) used the critical incident technique to develop measures of organizational citizenship behaviors in faculty in two business schools and a psychology department. His findings indicate that OCB in faculty has a collegial and an institutional component. That is that faculty perform voluntary pro-social behaviors for individuals as well as for the "good" of the organization. His work, however did not find that all five dimensions of OCB (altruism, courtesy, general compliance, sportsmanship and civic virtue) exist within the OCB exhibited by faculty. His work promotes a two factor model of OCB, one which describes organizational citizenship behaviors directed at individuals (OCBI) and those behaviors which benefit the organizational as a whole (OCBO). Skarlicki (1995) found that OCB directed towards the institution (OCBO) may be detrimental to the faculty members research productivity, while OCBI, or citizenship directed toward specific individuals, was positively correlated with number of publications. He posits that a social exchange, or reciprocity phenomenon is occurring wherein faculty who assist each other may be working together on research and scholarly activities. There was no correlation between OCB and teaching effectiveness as measured by teaching ratings.
Previous research has indicated that OCB is positively related to organizational effectiveness, yet Smith proposed that OCB may contribute more to the recipient's performance than it does to the provider (Smith, Organ, & Near, 1983). Smith, et al (1983) go on to note that OCB may actually have the immediate effect of sacrificing some portion of one's immediate individual output (p. 654).

**Measuring Organizational Citizenship Behavior**

Organ (1987) described the difficulty in measuring OCB. First, he notes that "having respondents report their own Organizational Citizenship Behavior and job satisfaction ratings contaminates any correlations between the two measures by common-method variance. Any defect in recall or rating is likely to occur across both measures." He supposes that some respondents who are dissatisfied with their work may actually overreport their OCB in order to justify their resentment at the workplace. He also notes that respondents tend to provide responses along a consistent line when completing questionnaires - they tend to provide answers that ought to go together, a phenomena common when persons answer surveys and questionnaires. Organ then describes the problems associated with having superiors measure OCB in their employees. Supervisors tend to rate subordinates with more global, less discriminate evaluations, therefore they may confuse an employee's OCB with superior in-role behaviors. To have a supervisors rate a person's OCB runs the risk of compromising the very essence of OCB - they are performed with no expectation of reward. Again, not all OCB are observed and the supervisor may only have a global idea of what behaviors the person actually performs. Lastly, the "unfinished business" in OCB research according to Organ is that researchers
have found it difficult to demonstrate that organizational members are able to discriminate between extra role and in-role behavior that it is difficult to reliably discriminate between OCB and activities that are generally regarded as "professionalism". He concludes his text Organizational Citizenship Behavior (1988) by noting:

"Perhaps a good deal more of "exploratory research" in the form of open-ended interviews with practitioners, will help in addressing whether, in fact organization members make a distinction between in role performance and OCB, and if not, whether something is gained by prodding them to make such a distinction." We may well find that we learn more about OCB by dispensing with any sort of "standard" measurement scale. To some extent OCB depends very much on context. Anchoring the construct in site-specific needs, problems, culture, norms, and traditions would aid immensely in mapping the domain of OCB. "One could hope for some research that gets around the rating problem altogether by using an objective indicator of some-perhaps very specific-exemplar of OCB. If we could identify in some context an archivally recorded response-whether at the individual or group level- that has reasonable fidelity to the OCB construct, we would have a valuable cross-check on findings with more subjective indicators" (p.107).

The assistance rendered by techno-profs then are most likely citizenship behaviors in that they do not fall under the job expectations of the faculty member. The money saved as a result of the techno-profs actions can be substantial in that monies are not spent on technical support to fix the problems, load the software or teach others as that
task has been accomplished by the techno-prof.

Summary of the Literature Review

The impact of technology on higher education is an evolving history. Since the advent of the computer and its subsequent inroads into higher education, the debate originally waged concerned the efficacy of technology use in teaching and learning. After 70 years of debate, the consensus reached is that technology is at least as effective as traditional classroom teaching. In an era of shrinking resources and increasingly diverse student enrollments, the use of technology to reach a wider audience in higher education is occurring. The major issues in the incorporation of technology into teaching and learning has been well documented by Steven Gilbert in his work with the Teaching and Learning Roundtable discussions for the American Association for Higher Education (Gilbert, 1995a, 1995b, 1996a, 1996b, 1997). Kenneth Green in his 1999 Computing Study found that the Chief Academic Computing Officers identify “assisting faculty integrate IT into instruction” and providing adequate user support” as the two most pressing challenges confronting their institutions.

Skarlicki and Latham (1995) confirmed that OCB has both organizational and individual components and he suggests that the exhibition of OCB by faculty may have both beneficial and deleterious effects on the good citizen faculty. Skarlicki and Latham’s work does not address the breadth and depth of the effects of OCB behavior upon the good citizen faculty, nor the technological environment.

It appears there are no published studies on the impact of OCB on technically proficient faculty. As the use of instructional technology expands into mainstream faculty
use in academe, research is needed to identify the social characteristics of the technically proficient faculty members who lead the way and offer assistance, and the effect that providing such assistance has on their careers.
CHAPTER THREE
METHODOLOGY

Organizations today exist within a constantly changing environmental dimension. Within an ideal organization, individual affiliates or members perform in substitutable roles, executing interconnected activities by using collective resources that are governed by organizational policies, rules, and reward systems. The purpose of these roles and activities is to enable the organization to accomplish its goals and objectives (Ahrne, 1994). Through their everyday acts of helping behaviors, techno-profs are actively absorbed in the organization’s pursuit of its goals. Yet they operate outside of the formal organizational structure in part because their acts are without formal recognition and compensation. They are the acts of the good citizens. The institutions permit and encourage these voluntary acts because they lack the financial resources to displace them.

To better define and analyze the position and role of the techno-prof, I developed a conceptual framework of the university as a social organization by combining the organizational models of Goran Ahrne (1994) and Shirley, Peters, and El-Ansary (1976). Further, I employed Organ’s (1988) theory of Organizational Citizenship Behavior as the conceptual framework for interpreting the interactions, contributions, and effects on the faculty studied.

Conceptual Framework- Social Organizations

Ahrne (1994) argues that social organizations are composed of the nodal
principles of affiliation, collective resources, substitutability of individuals, and recorded control. *Affiliation* in a social organization means a distinction made between members and nonmembers and it "is the single most decisive feature of the figuration of organization" (Ahrne, 1994, page 25). The concept of a bureaucracy, replete with specific career lines and defined roles, allows organizations to prescribe specific behaviors to further its goals. Affiliate positions into which individuals are recruited divide the necessary behaviors by expertise. These positions, however are *independent* of the individual (Ahrne, 1994). In a university, individual faculty are afforded the opportunity to become affiliates when they are offered and accept their appointments. At that time, they are extended the right to join the organization as members and are expected and entrusted to perform the tasks for which they were hired. No affiliate—in this case, a faculty member—is indispensable however; everyone can be replaced. Thus, organizational affiliates are *substitutable*.

Further, Ahrne argues, organizations utilize resources to accomplish their goals and objectives. The collective resources of an organization include physical resources, information, human resources, and funds, which are gathered or produced, maintained and used by the affiliates. Sufficient resources enable affiliates to realize organizational goals. The ideal requires the organization to provide sufficient resources. When it does not or cannot, the necessary resources must come from somewhere.

Finally, rules, reward systems, controls and policies within the organization provide recorded control of the affiliate performance. In other words, employment policies ensure that the affiliates behave in appropriate ways to further the goals of the
organization. In a university setting, annual reviews, promotion and tenure guidelines, and specific contract guidelines and position descriptions all serve to provide authority over individual actions of faculty.

Although Ahnne's conceptualization of an organization is appealing, it is nonetheless idealistic. An institution is more than the formal lines of the organizational chart, the ratified affiliates, and the governance policies. When an organization experiences significant change, it may not have the ability or may not choose to provide sufficient resources to sustain its goals and supporting behaviors. Its roles, resources, and policies created for a different environment no longer accurately pertain to the new demands. In this case, the organization must adapt or it will falter. Until it adapts, certain individuals within the organization appear to step in to supply what is needed. These affiliates extend themselves above and beyond their prescribed roles to perform discretionary acts that are neither part of their role nor recognized by the existing formal reward system. They contribute, however, in the aggregate, to the overall effectiveness of the organization. Organ (1988) refers to these nonrequired contributions as organizational citizenship behaviors (OCB). The affiliates who exhibit these behaviors are good citizens. In this case study, the good citizen affiliates who provide technological assistance to colleagues in particular and the university in general are the techno-profs.

An organization is not merely a structure as Ahnne posits. Organization, or in this case, universities, are complex interactive systems. Affiliates or stakeholders interact according to the formal structure, but also informally as needed. Robert Shirley, Michael Peters, and Adel El-Ansary (1976) describe organizations as being comprised of five
interconnected dimensions: environmental, strategic, structural, behavioral, and programmatic. Affiliates, such as faculty, staff, administration, and students do not merely interact, formally and informally within the organization, devoid of concern for extra-organizational influences. They also respond to environmental trends and influences, which includes another group of stakeholders, namely the public (Toby, 1971).

Shirley, Peters, and El-Ansary’s (1976) integrative systemic approach parallels some of Ahrne’s conceptualization, but additionally extends it. The environmental dimension, which Ahrne neglects, is comprised of the particular set of external circumstances within which the organization exists. The environmental conditions influence the goals and objectives, and ultimately the decisions and choices made by the organization manifested as the strategic dimension. The program dimension consists of the set of plans that the organization develops to meet its goals and objectives. The structural dimension, similar to Ahrne’s, consists of the processes, policies, procedures, authority relationships, job functions and incentive systems, that taken together, form the "anatomy" of the organization (Shirley and Caruthers, 1979). The elements within this dimension link the disparate parts of the organization into the whole that is the organization. Ahrne’s four elements of an organization; Affiliates, Resources, Control and Substitutability comprise the structure of the organization, in this case, the university. The interactions of the Affiliates occur within the behavioral dimension.

The behavioral dimension refers to the individuals who comprise the organization and the interpersonal, group and intergroup relationships which arise within the
The university as a social organization consists of two main dimensions, a structural dimension (the parts) and a behavioral dimension (the social interactions of the parts) surrounded by an environmental dimension.

The structural framework of Ahrne (1994), coupled with the integrative framework of Shirley, et al (1976) provided a conceptual framework by which the position and role of the techno-prof may be visualized within the university as a social organization (Figure 1).

Figure 1. A Model of The University as a Social Organization (Sources: Shirley, Peters and El-Ansary, 1976; Ahrne, 1994)
Conceptual Framework - Organizational Citizenship Behavior

To study the *techno-profs*, their contributions and the effects of their behaviors on their careers, the conceptual framework of Organizational Citizenship Behavior (OCB) as described by Organ (1988) was used. The concept of OCB has yet to be applied to faculty careers or to individuals who are technically proficient. The majority of OCB research has focused on identifying the specific behaviors within the phenomena of good citizenship within organizations. Several survey instruments have been employed to determine the specific behaviors that comprise the construct of OCB (Organ, 1988; Smith, 1983; Skarlicki & Latham, 1995). Factor analysis has been typically employed to map the dimensions of OCB with various numbers of factors within the OCB construct being reported (Skarlicki, 1995; Bateman & Organ, 1983; Smith, et al, 1983). Bateman and Organ (1983) found four factors in their original study of OCB, but summed the item responses for a single OCB score. A subsequent reanalysis of the data (Organ, 1988) provided three factors (General OCB, Mixed OCB, and Sportsmanship). Smith et al (1983) using a shorter survey of OCB extracted two major factors, Altruism and Conscientiousness. Moorman (1991) described five dimensions to OCB; Altruism, Conscientiousness, Sportsmanship, Civic Virtue, and Courtesy, although work by Organ and Lingl (1992) failed to support the five factor description. Work by Skarlicki and Latham, (1995), Williams and Anderson (1991), and Organ and Konovsky (1989) has revealed that OCB is distinctly two-dimensional construct, consisting of OCBI, citizenship behaviors that benefit the individual, and OCBO that are directed towards the organization. Smith suggested that OCB may have the effect of sacrificing some portion
of one's immediate individual output yet the impact of OCB has not been reported. Skarlicki (1995) found that OCBI behaviors contributed, while OCBO behaviors detracted from faculty member's productivity as measured by numbers of scholarly publications.

Organ (1988) has noted that perhaps "more exploratory research in the form of open-ended interviews with practitioners will help in addressing the question of whether, in fact, organizational members make a distinction between in-role performance and OCB" (p.103).

The conceptual framework employed for this study is that of Organizational Citizenship Behavior as defined by Organ (1988), which has been refined into two main subcategories of OCBI and OCBO, as described by Smith, Organ & Near (1983); Williams & Anderson (1991); Van Dyne, Graham, & Dienesch (1994), and Skarlicki & Latham (1995). The concept of OCB has not been linked to career effects, but rather has been related only to overall organizational effectiveness. The effects of providing OCB on the individual has remained unexplored to date. Thus, this study considers the techno-prof as an individual situated within the Affiliate portion of Ahrne's (1994) organizational framework and as a faculty member whose helping behaviors are consistent with Organ's concept of Organizational Citizenship Behavior. The nature of those behaviors, i.e., the types of technological assistance provided and the effects providing them have upon the provider was examined. The technologic assistance techno-profs provide in the form of individual citizenship behaviors by techno-profs was categorized into the subcategories of OCBI or OCBO, which, when combined, form the
total or aggregate citizenship behavior exhibited by a techno-prof. The types of behaviors provided by each techno prof was determined as well as the time involved and the complexity of the behavior supplied. As a body of aggregate citizenship behaviors, these deeds intersect with the role expectations of the faculty member as either intra- or extra-role behaviors. When the actions and productivity of a faculty member match the normative expectations of the organization, it can be expected that the faculty member will be successful. As the OCB demands on the techno-prof exceed that which he or she can accommodate, or when the OCB performed detracts the faculty member away from the norms of what is expected it may be expected to affect the faculty members career. A conceptual framework of techno-prof behavior appears as Figure 2.

Figure 2. Organizational Citizenship Behaviors (OCB) of Technologically Proficient Faculty [Techno-profs]. (Sources: Organ, 1988; Williams and Anderson, 1991)
Methods

This qualitative case study identifies and describes the Organizational Citizenship Behaviors exhibited by a specific type of faculty member, the *techno-prof*, and explores both impact that these individuals have upon their institution as well as the impact that their behaviors have upon their own academic careers. To obtain the information required, semistructured ethnographic interviews of technically proficient faculty members, their deans, and the chief technology administrators at two institutions were obtained (Borg and Gall, 1989).

The first step in the study was to determine the existence of techno-profs at the departmental level. Knocke and Kuklinski (1982) note that network analysis is comprised of four main elements: sampling units, form of relations, relational content, and level of analysis.

For this study, the unit of analysis were the *individual faculty members* (known as actors in a network analysis) from two separate departments at two different universities. Relations among actors possess both content and form. The relational form chosen for this study was *assistance seeking dyads*, that is faculty were connected to other faculty because one approached another for help with technological problems. The relational content in this case was *communication linkages*, since channels were created between actors through which information, assistance or advice was communicated, and citizenship behaviors were provided. An *egocentric network* level of analysis was employed wherein each individual actor (faculty member) is a node and all others with which it has relations, in this case assistance seeking communications are represented by...
lines drawn between the nodes to form dyads, or pairs of nodes (Knocke & Kuklinski, 1982). Faculty members with multiple, or a majority of lines were deemed to be the departmental techno-profs as they were the faculty members to which a majority of their colleagues sought out for technological assistance.

**Site Selection**

Kenneth Green’s 1997 *Campus Computing Study* indicates that on the whole, four year public institutions lead the nation in use of information technology in teaching and learning. Green’s 1999 Survey shows similar results, with four-year public colleges and universities having the lowest percentage of institutions reporting financial planning for Information Technology. Therefore, the initial decision in selecting institutions to study was to focus on public four-year colleges or universities. The institutions to be used in this study were drawn from four year, Doctoral I institutions in the Southeastern United States.

Faculty activity within the institution formed the second basis for site selection. A wide range of activities as reported by faculty was considered most conducive to both the use of technology (therefore teaching and research must both be significant faculty pursuits), and service must also be an important activity as the conceptual framework, in part is concerned with the provision and recognition of service behaviors.

The breakdown of the principal work activity of faculty at public doctoral institutions, according to the 1993 National Center for Education Statistics Survey Report (Zimblter, 1994), consists of teaching, 53.4%; research, 17%; administration 12.6%; and service 17.5%. Since this institutional classification provides the widest
range of faculty activities, this category of institution was chosen as the sector in which
the techno-profs within their institutions would be studied. One moderately large
(>10,000 students) and one smaller (<6,000 students) doctoral institutions were selected
to provide a broader range of organizational size. The departments, however, were
selected so that they were similar in size (30-50 members) and faculty mix (numbers of
full, associate, assistant professors, and instructors). Both departments were in the area of
Humanities or Arts and Letters. The institutions are identified as *Inland University* and
*Coastal University* throughout this study to protect the identity of the individual faculty
and administrators interviewed.

**Participant selection**

Using the departments WWW home page, I obtained a list of the departmental
faculty e-mail addresses and sent an e-mail asking for their participation (see Appendix
A). To identify the technically proficient faculty members I employed a world wide web-
based survey (see Appendix B.) The web-based survey was a CGI (common gateway
interface) script using PERL (Practical Extraction and Report Language) which interfaced
with the web based HTML (Hypertext markup Language) survey form. In each e-mail
request, a unique web address was provided that allowed the faculty member to access the
web based survey. Each respondent was provided a unique URL (Universal Resource
Locator) which had a random number attached to it. The identification number allowed
for respondent identification and all survey input was captured by the CGI script and
saved into a SQL (Sequential Query Language) database. Information from the database
was generated into a table format which allowed each individual respondent’s responses
(first and second choices for assistance) to be listed by name for each of the four survey questions.

A follow-up e-mail reminder was sent after one week to all faculty who had not responded to the initial request for participation (see Appendix C). Analysis of the respondents surveys revealed loci, or nodes, for the departmental sociograms which identified the individuals to whom the faculty went for technological assistance. I then performed a network analysis and generated sociograms by hand for Coastal University (see Appendix D) and Inland University (See Appendix E). As a result, I identified three techno-profs, two at Coastal university and one at Inland University.

Confidentiality and Permission

After receiving permission from The School of Education Human Subjects Committee at the College of William and Mary to proceed with my research, I requested and received permission to conduct my research from the provosts at both institutions. A copy of the cover letter to the provosts appears in Appendix F. Faculty and administrator participants agreed to be interviewed after being apprized of their rights. All interview materials and data remain confidential. No personal or institutional names are identified in any report of results.

Data Collection

I conducted semi-directed interviews of these faculty, their deans and the technology administrators (see Appendices G, H, I) at each of two institutions to gather data about who the techno-profs are, what types of assistance they provide, how their efforts are perceived by their organization, and what effects of being the techno-prof has
Interviews with the three techno-profs were conducted using an interview schedule which was divided into two main sections and included items based upon each of the major sections (individual background, OCB behaviors, roles/rewards, motivation and career effects) of the OCB conceptual framework in Figure 2. Each interview was audio taped and field notes were taken. Copies of the cover letters to the Techno-profs, Deans, and IT Administrators appear in Appendix J. The consent form signed by each individual agreeing to be interviewed appears in Appendix K.

I also interviewed the deans from each college and the chief information technology administrators to determine the extent to which the behaviors of the techno-profs are recognized and rewarded. The interview schedule for the deans was primarily concerned with the diffusion of technology in their college and their perceptions of faculty who assist other faculty. Interviews items were based upon the four major elements of the conceptual framework of the university as a social organization (Figure 1), with the affiliate techno-profs as the focus of items related to faculty who help other faculty. Interview items also included items related to resource issues, faculty roles, promotion and tenure policies, and faculty hiring and training issues as related to technology. These two interviews were also audio taped and field notes were taken. The last two interviews were conducted with information technology administrators at each institution under study. Interview items were also based upon the conceptual framework of the university as a social organization (see Figure 1) and included items concerning the diffusion of technology on campus, institutional technology support,
faculty training and recognition, use of proficient affiliates, and IT planning.

Data Analysis

E-mail requests were sent out to forty seven faculty members in the [Humanities ] Department of Inland University. Nineteen faculty responded within the requested two week time frame. An additional five responded after receiving a follow-up e-mail requesting their participation. E-mail requests were also sent out to thirty one faculty members in the [Humanities] Department at Coastal University. Ten faculty responded within the requested time frame and an additional three responded after receiving the follow-up e-mail request.

Results from the web-based survey were hand tabulated and sociograms created with network linkages drawn between actors (faculty) who identified specific individuals to whom they went for assistance. First choice and second choice responses were drawn with solid lines and dotted lines respectively for each of the four questions asked. Actors who did not go to another faculty member were included in the sociograms, but had no lines drawn from their data point. A composite sociogram (all four questions, with all first and second choice interactions drawn) provided a consolidated view of all faculty interactions in the department. Actors with the greatest number, or majority of lines of lines resulted in a “star” focal point, indicating the departmental techno-prof(s).

I analyzed the interviews of the techno-profs, deans and IT administrators using an editing analysis style (Crabtree & Miller, 1992). I transcribed each of the interviews and divided the responses to each interview question into separate areas based upon the original seven research questions. Then I was able to further relate the responses to the
main categories of the conceptual framework for organizations (Figure 1) and the main elements of the conceptual framework for OCB behavior of the techno-profs (Figure 2). The seven main research questions gave rise to a series of Interview questions a separate set for the techno-profs, deans and information technology administrators. The interview questions were in turn grouped in order to cover each of the main sections in the conceptual frameworks for organizational citizenship and the university as a social organization. The analysis matrix appears as Table 1.
Table 1

Research Questions/Interview Items - Conceptual Framework Matrix

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Interview Items</th>
<th>Conceptual Framework for Organizational Citizenship Behavior</th>
<th>Conceptual Framework of the University as a Social Organization</th>
</tr>
</thead>
</table>
| 1. Who are the techno-profs? | T: 1, 2, 3, 4, 5, 6, 7, 14, 21, 22  
  D: 1, 2, 3, 4, 5, 6, 9, 12  
  A: 1, 2, 3, 4, 15, 17 | Individual techno-prof Characteristics | Affiliates (Identity and Interaction) |
| 2. What are the employment characteristics of the techno-profs? | T: 8, 9, 10, 11, 12, 13, 14  
  D: 7  
  A: 4, 14 | OCBO/OCBI Aggregate Citizenship Behavior | Resources (Assets and access) |
| 3. What do they do? (Types of assistance) | T: 9, 13  
  D: 10  
  A: 12, 14, 16 | | |
| 4. Faculty activities? Discretionary or Role? | T: 15  
  D: 4, 7  
  A: 5, 13, 14 | Role Expectations and Rewards | Substitutability (Roles and Responsibilities) |
| 5. Are their activities rewarded? | T: 16, 19  
  D: 7, 8, 11  
  A: 5, 8, 10, 14 | | Control (Policies and Procedures) |
| 7. What are the career effects? | T: 16, 17, 18, 20  
  D: 11  
  A: 9 | Career Effects | |
Three techno-profs were identified using network analysis of data obtained via a web based survey sent to two doctoral universities in the Southeastern United States. Interviews were then conducted with the techno-profs, their deans and the IT administrators at both institutions. The conceptual framework of social organizations as suggested by Ahrne (1994) and Shirley, et al (1976) were combined to form the basis for the analysis of the interview responses. The theory of the organizational citizenship behavior as described by Dennis Organ (1988) served as the conceptual framework by which I describe the phenomenon of the technologically proficient faculty member, the techno-prof.
CHAPTER FOUR
RESULTS

Unquestionably, techno-profs are a valuable resource to the institutions that employ them. They provide almost daily assistance to their colleagues at great risk to their own academic careers. As institutions struggle to keep up with the diffusion of technology, they appear increasing to rely on the departmental techno-profs to meet technological needs, while neglecting to modify their reward systems to recognize these good citizens. Distinctive patterns emerged from my interviews that illustrate an obvious disconnection between the needs of the organization and the employment fortunes of the faculty who help meet those needs through their voluntary behavior.

The degree to which organizations, in this case universities, have been able to respond to the ever-changing technological environment depends upon their ability to adapt their resources and their affiliates behavior to the needs brought about by the changes. Technology has enticed some departments to transform themselves through the behaviors of individual faculty within them. Other departments have remained untouched as the diffusion of technology swirls around them.

Normative State

In a normative setting, Ahrne (1994) notes that individual affiliates will possess several different affiliations; kinship, citizenship, and organizational. In this case, individual faculty affiliates possess strong ties (affiliation) to both the institution through
their employment and to their disciplines as well. In the normative scenario, affiliates produce, maintain and consume a portion of the collective resources that exist within the organization (Ahme, 1994). Faculty are hired for a specified salary, are typically provided an office and computing equipment, sometimes receive start-up funds for research, all of which consume organizational resources. In return they are expected to teach a certain number of courses, perform scholarly activities, sometimes obtain external funding and perform institutional, community and/or disciplinary service. To ensure that organizational affiliates comply with the policies and procedures that govern the organization a system of rewards and punishments exist. In the university case, annual reviews and promotion and tenure guidelines form the basis for the control of faculty affiliates. Affiliates are arguably the most important part of an organization, for without them, the organization would not exist. Ahme (1994) argues that individual affiliates, however, cannot be invaluable, or be irreplaceable since, in their absence, the organization, by definition, would crumble and cease to exist. The concept of substitutability has two aspects according to Ahme (1994). They are the problems of substitution and of succession. If an affiliate cannot come to work or function for a short period of time, a substitute must be found to carry out the duties that the affiliate is assigned to provide. The other aspect of substitutability is that of succession. Ahme (1994) notes that "one of the most common methods to facilitate succession is the notion of career." (p.19). By having disciplinary-based, tenure-track faculty positions into which individuals are hired, the university as an organization exists independently of the individual faculty. If a faculty member leaves or is unsuccessful in his/her bid for tenure,
a new person can replace the "hole" left in the department. The normative state of the faculty affiliates as they inhabit the university is depicted in Figure 3.

Figure 3. The Normative State of Faculty in the University as a Social Organization

This normative state, however is rarely static. The environmental dimension is a dynamic set of economic, social, politico-legal and technological forces to which the university must adjust and accommodate.

The Environmental Dimension

If an organization is to survive, it must adapt to the dynamic set of conditions, constraints, and opportunities that comprise the external environmental dimension. Shirley, Peters, and El-Ansary (1976) divide the environmental dimension into four separate, yet interrelated sectors: economic, social, and politico-legal and technological. The economic, social and politico-legal sectors comprise the external forces that
stimulate the expansion of the *internal* technological environment of the university.

**The Economic Sector**

The economic sector includes such phenomena as the nature of the competition an organization faces and the changing demand for the organization’s products and services. The changes occurring within the economic sector of the United States are no less than revolutionary. The United States is experiencing a shift from a labor-intensive economy to an information-intensive one (Snyder, 1996, page 1). To remain competitive in a 21st century global marketplace, organizations are reinventing themselves to such an extent that growing number of employees at all levels use some sort of technology to perform their jobs. This shift has created a need for a workforce that possesses technological literacy. Universities, in turn must respond to the needs of the marketplace by redesigning their curricula to more accurately reflect the new range of knowledge and skills required by employers. The triple requirements of a well trained, educated, and technologically-proficient workforce have also stimulated the rise of a plethora of for-profit ventures in post-secondary education.

The Pew Higher Education Roundtable (1994) considers the environmental changes to be so powerful that "no institution will emerge unscathed from its confrontation with an external environment that is substantially altered and in many ways hostile to colleges and universities" (1a). Traditional colleges and universities, once competing against each other for students and tuition dollars, now find themselves in stiff competition with new players—the corporate world and for-profit "virtual" universities. These new participants have positioned themselves to respond to consumer and economic
demands more quickly and more efficiently than most traditional academic institutions.

The Social Sector

The social sector within the environment includes in this case the social values and behaviors concerning technology as well as the prevalent consumer demands for inclusion of technology in higher education. The two major social changes affecting higher education are: 1) an increasingly technologically sophisticated public; and 2) a growing nontraditional student population, which is driving the distance education movement.

The use of computing technology by the general public increases annually. Two years ago, the National Telecommunications and Information Administration (NTIA), (1998) estimated that 40% of Americans were connected to the Internet. This technological sophistication has tremendous ramifications for higher education institutions. Citizens want options regarding how, when, and where they obtain access to educational programs. Demand by the public has expanded beyond the traditional degree to include a demand for skill enhancement, new skills, and for certifications ([State] Coordinating Council, 1998). Increasingly, citizens want education delivered directly to them rather than their having to attend classes at a college campus or other setting. The population seeking a higher education includes a substantial number of mature learners who may not want the traditional extra-curricular services and activities provided by an on campus atmosphere. Higher education is evolving into a learner-centered rather than a campus-centered activity. Fueling this change is the use of and expectation that technology will be part of the higher education experience. "Without question,
technology has become a pervasive part of the college experience. Students of all ages and across all fields come to campus expecting to learn about and also learn with technology" (Green, 1998, page 1).

The shift to a learner-centered enterprise is most evident at Coastal University, whereas Inland University seeks to retain a more traditional, campus-based, residential learning environment. Pressure is evident, however, to increase the presence of technological innovation at Inland. The Information Technology Administrator (ITA) at Inland, explains the environmental press:

Students drive this right now, they grow up with it, then there's pressure [for the university to provide technology]. Especially if you take a course from a faculty member who incorporates something really neat, and you really like it. You start looking around for other courses like that, and that I think is the new pressure that we've been seeing for the use of technology.

The dean at Inland echoed these sentiments by noting that parents of potential students tend to look at ‘paper and ink’ publications, college viewbooks, etc. to get information about an institution. Potential students tend to look at web pages to gather comparative information about schools. Expanding on this idea that the external environment is driving the use of technology within higher education, the IT Administrator at Inland said

The technological drivers are the network and the World Wide Web. We know it's societal. It's pretty easy to get stuff off of the Web that you can't get at the library.

At Coastal, the demands of the social sector are being addressed in various ways.
The ITA, describing the population served by technology enhanced and distance
delivered programs, said:

I think that [Coastal] already had a mind set that there are alternate ways
of delivering instruction. We can deliver instruction to students who are
part-time, we can deliver them in the evening and one doesn’t always
need to be available between 8 and 5 to go to school. With that said, we
also said that we would take our programs off campus. You know, create
a program for a school, a division, or a hospital or a corporation, off-site.
So, when we’ve pushed the envelope then, to deliver it by distance
learning technologies in the evenings to part-time students, then you’ve
given access to an education at a time and a location when it was
convenient. So, technology is just another tool to reach students at
alternative times and days.

For Inland, one major inducement to increase its technological sophistication is
that the students they attract are already technologically sophisticated themselves. The
dean at Inland spoke of these students:

The students, particularly the high school students—the ones we go after
because we’re highly selective—they’re demanding a very high level of
visibility and proficiency on this thing [technology]. They’re looking at
our web site. They’re poking around, seeing how many courses have web
sites, how many courses have [technology]. I mean, they’re looking at us
in ways that many of us, I think, don’t understand.
The second major social change in higher education involves the ascension of technology-supported distance education over the past few years, a rise in activity level which has been described as 'dizzying' (Lewis, Snow, Farris & West, 1999). In order to respond to the needs of non-traditional students who may be place, or time-bound, many institutions now offer distance education programs. Technology-supported distance education has expanded at a rapid pace nationally as many colleges and universities attempt to increase access to higher education and to boost enrollments. Lewis, et al in the National Center for Education Statistics Report on Distance Education at Postsecondary Institutions (1999) reveals that approximately 44% of all colleges and universities in the United states now offer distance education courses, and that an additional 20% of institutions plan to offer distance courses within the next three years. The number of courses offered via distance technologies doubled from 1995 to 1998 to over 52,000 distance courses. The number of students taking technology supported distance courses in 1997-98 was 1.6 million out of 14.6 million students enrolled in traditional 2 and 4 year colleges courses (Lewis, et al,1999).

Coastal University has invested heavily in distance education and possesses a thriving televised and off-campus course delivery system, which enrolls 30% of the University headcount enrollment and accounts for 20% of the Full Time Equivalent (FTE) credit hours produced at the university ([Coastal University] Distance Education Summit, 1999).

At Inland, distance education is not a primary mission of the institution and is neither promoted nor encouraged at the institution. The institution prides itself for
providing an excellent traditional liberal arts education in a residential setting.

The ITA at Inland noted that "branding", putting an institution's name on an educational product and then offering it to distant markets is an expensive project and not really necessary for all institutions, and is not a high priority for Inland.

This branding piece is going to be an important driver of this distance education thing. It's going to be a negative, I think. It costs money to do distance education no matter what they tell you. The only way to make money is to have a lot of students paying you a lot of money.

The dean at Inland shares this view of distance, technology-supported education. His concern lies with the real costs of such endeavors. He underscored the IT administrators comments:

Some member of the Board of Visitors, who's just read an article in Fortune magazine about the University of Phoenix- who says, "Well, I guess in ten years you guys won't be teaching in the classroom anymore?"

You know, I have to say, "Now, wait a minute, let's think about this. What are we really talking about? What kinds of courses does the University of Phoenix teach? Do they teach ethics? No, they teach accounting." You know, and then they'll say "Well, we're sure going to save a lot of money." I can say "Well, you know, I talked to the president of Cal State-Chico, which does a lot of distance learning, and each of their courses cost 1 to 3 million bucks. I can put up a course with a faculty member for a whole lot less than that guy!"
Coastal and Inland are clearly on different paths with regards to distance education. For Inland, the push to increase technology into the curriculum is based more upon their desire to attract and retain high quality undergraduate students who have grown up with technology and expect it at the college level, yet also want a traditional residential collegiate experience. However, Coastal seeks to create a niche as the premiere technology distance education institution by providing an array of distance and non-traditional educational programs to students. Both institutions are compelled to increase the incorporation of technology into their undergraduate, in large part due to an economy that requires technologically-trained individuals, and a public that expects to learn more about and with technology. Both institutions have a computer literacy requirement for undergraduate students, regardless of major field of study. The social espousal of technology is a powerful force pushing both universities, and hence the faculty, to adopt technology more widely as a means to provide post-secondary education.

The Politico-legal Sector

This sector embodies the policies, regulations and laws that either present opportunities or place constraints upon organizations. The economic sector has enumerated the need for a technologically literate workforce. The social sector embodies a populace, increasingly familiar with the use of technology in their everyday lives, expecting more technology in the content and delivery of their higher education. The politico-legal sector, in this case, responding to both of these needs, has mandated that the use of technology be expanded in the institutions of higher education. Increased funding from the state has provided monies for initiatives to accomplish this objective.
Both universities in this case are publically-funded institutions within a mid-Atlantic state. The state’s legislature passed House Bill [number] in 1997 that mandates the state’s higher education coordinating council, in consultation with the state’s Department of Education, to develop guidelines to ensure that teacher education programs included training in the use of educational technology. The Bill states:

In order to improve the quality of the [state’s] workforce and educational programs the governing bodies of the public institutions of higher education shall establish programs to seek to ensure that all graduates have the technology skills necessary to compete in the 21st century, and particularly that all students matriculating in teacher training programs receive instruction in the effective use of technology (House Bill [number], 23-9.2:3, part C, 1997).

The coordinating council’s Report to the Governor (1997) delineated twenty-eight specific guidelines concerning technology incorporation into the state-approved teacher education programs so that the House Bill [number] mandates could be met. The guidelines included recommendations that colleges form departmental technology advisory committees, that institution-wide networks be established, that every faculty member should have access to a network-ready multimedia computer for classroom use, and that every faculty office should be provided with a computer with the same capabilities. The guidelines included specific expectations that teacher-education faculty integrate technology into their classes and that faculty in the arts and sciences do likewise since much of the coursework prospective teachers take are in those areas.
Recognizing that all programs of study and all institutions could potentially benefit from the use of technology, the governor and the legislature initiated a four-year plan to provide funding for technology for all of [State] higher education. Through the Higher Education Trust Fund (HETF), $79 million dollars were earmarked for technology (and $25 million dollars for operating funds) to be used for:

... integrating technology into teaching and learning and to provide automated systems to advance restructuring and cost-cutting efforts of institutions. For the first time, the total technology requests are more than the requests for all other operating budget needs, underscoring the importance of technology to the teaching and research missions of institutions (Distance Learning in [State], http://www.____.edu/, 1998).

Universities have responded to these mandates by pushing for an increased presence of technology within their curricula. Necessary corollaries to this push for increased technology use are faculty acceptance, training, and support. Initiatives to train faculty in the use of technology have encompassed a number of methods including workshops, development grants, online instruction modules, consultation services, roundtables, training sessions, and symposia ([State Coordinating Council] Report, 1997).

The State Coordinating Council Report (1997) also recognized that an effective technological support system was an essential requirement in any effort to diffuse technology within an institution:

Without a well designed technical assistance system efforts to infuse technology into teacher education programs will surely fail. The technical
support system must be thought of as a core element of a technology plan; essentially it is an investment in the system to ensure that users will take the necessary risks to adopt technology into their teaching repertories” (page 11).

Technology planning, however, is an imperfect science. The difficulties in planning in an environment of constant and rapid change is best stated by the ITA at Inland:

Don’t get me started on that—there’s no such thing as a strategic plan for information technology! People tend to think of strategic plans in terms of five year horizons. There’s no such thing as a five year horizon in technology. We are on a fast moving train and the landscape changes all the time. What you need is, and I don’t know what the right name would be, I’d call it a fluid plan or a flexible plan, or anything but a strategic plan. I just don’t like the context, that we are going to decide what we are going to look like in five years, and this is how we’re going to get there, because, it changes too fast. What you have to decide, is what your vision looks like and paint that in some kind of way that people can understand.

It’s the hardest job I have.

Despite the difficulties in planning for technology, the diffusion continues at both institutions and faculty are expected to learn about, and to adopt, technology.

The Technological Environment

Driven by an economic environment that needs a technologically literate
workforce, both universities in this case have invested heavily in technological infrastructure in order to meet the new demands of the marketplace. Coastal has multiple initiatives as part of its technology-supported distance education program. Both institutions are increasing the use of technology within their traditional courses in response to social and politico-legal demands.

Inland, however, has only recently begun incorporating technology into the infrastructure of the institution. The ITA, speaking of the “newness” of computing technology and networks at Inland, explained that:

This campus is still pretty young in terms of technology, and by young, I mean immature. They only had networking here in the true sense of the word, probably in '96, which is very far behind the curve, and what that means for a faculty is, if you’re five years behind in technology, you’re light years behind. So, they’re just starting to learn various ways to deal with technology in the curriculum.

Part of the problem in the past, he suggests, was that technological innovations were not user friendly and were time consuming for faculty to learn. Educational applications for much of the software was not immediately obvious to the mainstream faculty, and as many computer applications became obsolete, faculty realized they had “wasted a lot of time” trying to learn how to incorporate technology into their teaching. The situation is changing however, and the ITA now believes that the educational use of technology has matured to the point where it is relatively easy for the mainstream to use.

I think now, the last two years especially, [with the] real growth of the
Web and some new tools that make it easier and easier, we’re going to see, for the first time, the promise that technology might do something in education—actually becoming a reality. In the ‘80s technology was going to be the answer to all the problems in higher education. And it failed miserably. I think that we’ll see a paradigm change in our educational ability over the years with technology and that will be a real plus.

At Coastal, the use of technology has a longer history, with attempts to incorporate computing technology into teaching and learning being made in the early 1980’s. The ITA described the early attempts.

Well, I had responsibility, way back in 1982, for developing a computer literacy program. The charge was to help faculty learn how to use a computer. That meant, turn it on and use it for managing grades and software applications, word processing, spread sheets. It was a very scary era between ‘82 and ‘90. In 1990 we began using the computer for communication, listservs, and email, for interaction between faculty and students at a distance, and we integrated the computer as an interactive, to promote interaction between the student and the faculty. In 1993, I wrote a grant proposal to the Sloan Foundation in which the accounting department was going to put their baccalaureate program "on line". But, we had no infrastructure on campus to support distance learning by computing. Because of that, I did not get the Sloan grant.

Currently a variety of technology initiatives exist at Coastal, including six
complete degree programs being offered online, synchronous and asynchronous components to hundreds of courses, and a thriving distance education program with over 180 faculty teaching on television. ([Coastal] Distance Education Summit, 1999).

The Structural Dimension

As Shirley, Peters, and El-Ansary (1976) argue, the structural dimension constitutes the "anatomy" of the organization, in this case, the university's. The formal and informal arrangements that exist within the organization are established to coordinate activities so it may accomplish its goals and objectives. The structural dimension therefore, consists not only of the physical items that comprise an organization, but also the mechanisms and processes which link the various parts. These linkages take the form of job functions, authority relationships, communication channels, policies, and incentive systems (Shirley, et al, 1976). Ahrne's model of organizations provides a useful format for understanding the structural dimension through his concepts of collective resources, recorded control and substitutability. In this case, the technology resources of each department in this study are reviewed, the policies and procedures that control faculty actions, and the substitutability of the techno-profs are discussed.

Collective Resources

The deans and the ITAs were quick to note that all faculty have computers on their desktops and that a substantial institutional investment in the technology infrastructure has been made over the past years. State funds were used at Coastal university to purchase large numbers of computer technology over the past three years.
while at Inland University, a pilot project is now underway in which computing hardware and software is being leased rather than purchased. With this type of desktop computing management system, hardware is replaced every three years and software upgrades are installed at regular intervals. Virtually every faculty member at both universities has an office computer that has at least a minimum configuration of word processing and discipline-specific software, access to the Internet, and e-mail capabilities.

At Inland the leasing program is being instituted so that PC desktop control can be maintained at a central level. At Coastal computer purchases are managed at the college and department level, with the central computing center providing specific system configuration information to ensure compatibility with campus networks. Coastal possesses no institution-wide plan for the purchase, distribution and upgrading of desktop computers. Those college and departmental technology acquisition plans that do exist often employ an "acquire and retire" method of purchasing newer technology whenever funds become available. This method involves replacing a proficient user’s system and moving the hand-me-down to replace another faculty member’s system until at last a system is retired out of the loop.

The "acquire and retire" method used by many colleges and universities fails to take into account the high cost of maintenance, support, and training required to keep such aging systems connected to a campus’ network. The ITA at Inland noted that “the real cost of ownership, what [faculty] don’t understand, is that by spending $2,000 [for a new computer], it just cost me $18,000 [in support, training and maintenance].”

What has occurred at both campuses is that substantial amounts of institutional
resources have gone to purchase or lease technology. Whether it is desktop or laptop computers, network servers, projection devices, printing, scanners, multimedia classrooms, or digital imaging equipment, a huge investment has been made in hardware and software acquisition over the past five years. What has been lacking is a structured plan to ensure that faculty are adequately trained in the use of this technology and, that once installed, an adequate support exists to address the problems that inevitably arise. Training, supporting, and helping faculty integrate technology, as Green (1999) has discovered in each of his campus computing surveys of the past three years, remain the top issues for both of the institutions in this case as well.

Technology Training and Support

Training faculty to use this equipment has lagged for all but a few of the faculty at the institutions studied. The centralized "help desk' model of the 1980's and 1990's is a woefully inadequate way to support faculty adoption and use of technology into their academic lives. To their credit, the institutions have both realized that a more decentralized method of helping faculty is needed. The Departmental Liaisons and Technical Support Person methods at Coastal and Inland Universities speak to the fact that faculty tend to prefer individual and on-demand instruction rather than through structured classes or seminars. That the Departmental Liaisons often have disciplinary expertise in the area to which they are assigned also speaks to the idea that faculty prefer to learn from individuals who have some common understanding of what they are trying to accomplish with the technology they wish to use. Despite the existence of both traditional help desks and departmentally-located technical support staff, mainstream
faculty apparently still seek out and use techno-profs as a source of assistance for technological problems.

Technology training and support for faculty has evolved at both institutions into a blend of both centralized and decentralized support services. Both universities have instituted a Technology Support Person (TSP) concept for the provision of assistance at the college, department and individual level. The TSP is an individual who resides within the college and handles all technological problems at their source. Any issues or problems he/she is unable to handle are referred to the central computing services area or help desk of the university.

At Coastal University, they expect the TSP to handle "one hundred questions" for every problem that gets referred to the help desk. At Inland University, the TSP is referred to as the Departmental Liaison. At Inland, the computer servers are centralized, but individual support is being transferred from the help desk to a more decentralized system via the Liaison who is assigned to cohorts of departments. A four-pronged training and support structure, the system at Inland consists of a traditional help desk, departmental Liaisons, a training group, and engineers. The training group is designing applications training modules to be delivered via the web en masse to the users across campus. The Support Center (help desk) is available to answer the basic technology questions and the engineers "keep the systems running".

Mainstream faculty training in the use of technology, however is neither structured nor mandatory at either institution. At Coastal, a Center for Learning Technologies exists to assist faculty who wish to learn more advanced educational uses of
technology, including web page construction, course design for technology delivery, and televised instruction training. However the mainstream faculty are not trained with any regularity. Faculty who are scheduled to teach on television are required to attend training sessions at the Center at no cost to the department. Much of the on-campus faculty training is offered through a faculty/staff training center which offers day- or week-long courses on specific software application (word processing, database, network, presentations, spreadsheets). This on-campus training group, interestingly, employs off-campus trainers to come and teach in on-campus computer labs. The courses are inexpensive ($45) to moderately expensive ($175), and the costs must be borne by the department. The Dean at Coastal sharply criticized this means of faculty training, saying

I've done that [used the training center] twice and it's an irritation because it's a waste of money. They take four hours to tell you something that you could learn in twenty minutes. And then they bring in somebody from outside the campus who doesn't even know what we have here and they say "I don't really know how you do it on your campus." Give me a break.

Neither dean reported that funds existed for general, mainstream faculty training on the use of technology. The dean at Coastal described the training of faculty in his college as a "random" process. The dean at Inland noted that training in his college occurred in three arenas: first, they are relying on the Departmental Liaisons to "help anyone who needs to load software and to troubleshoot [technological problems]. Secondly, faculty at Inland can also receive World Wide Web training at the Library,
which offers seminars on educational uses of the Internet. Lastly, faculty teach faculty, primarily at Coastal university. A panel of technologically advanced faculty are empaneled in a series of more or less semi-annual seminars to assist faculty new to teaching in distance education and give them the opportunity to ask questions.

As the nation transitions towards an information-based economy, Snyder (1996) predicts that organizations will eventually be made up largely of teams that are less hierarchical and more democratic in structure. For higher education, he envisions more partnerships with employers, more team teaching, and more competition from alternative entities including employers, to provide the education and training of the workforce. Coastal University has established several partnerships with regional technology corporations to offer an extensive workforce retraining program in information technology with the expressed goal of increasing the quantity of highly skilled technology workers. The ITA explained the new system of leasing faculty computers.

We will have 150 desk top machines leased and on the faculty desks this summer. They’re here for three years and then they’re gone. They’re upgraded each summer, for two summers. When you decide to do something like this, the price goes way down, because you’re buying in volume, there’s a potential for selling, [to] this campus, a thousand computers a year, so you can get somebody’s interest on leasing a thousand computers. They’re willing to talk, because they hear a thousand! And, they will load the software that I want on the machines at the factory, so I don’t have to mess around with software loads or
configuring in things for the network, or putting addresses in. All that is
done for me.

The ITA at Inland described an abbreviated "training" that faculty receive when a
new computer is placed upon their desk. The leasing program contains a short training
period for each new machine. The computer repair faculty at Inland is "being phased out"
since repairs to desktop PCs will performed via the contract with the leasing company.
The ITA said:

The company itself, installs the machine on the faculty’s desks and gives
them at least fifteen minutes time. My people will spend an hour once it
arrives with them, getting them used to [it]. It’s under warranty for the
entire period of time, anything--any problem--the vendor is here to fix it,
and will guarantee a replacement machine while they’re fixing it. They
come on campus. You don’t have to take it off and ship it somewhere.

The procurement of relatively new computing equipment for faculty use is relatively
certain at both institutions. Faculty who want technology are usually able to obtain it. At
issue, however is faculty training in the use of this technology once it is placed on the
desktop.

**Structural Support Needs**

Assisting faculty in the integration of technology into their work and providing
those faculty with adequate technical support have emerged as the top two most
important issues facing higher education (Green, 1999). How best to address these two
issues has involved myriad approaches: centralized support centers, decentralized support
staff, in-house and out-sourced training programs, technology grants, and incentives.

As the spread of technology throughout academe quickens, the need for assistance with technological problems has become a priority issue, and is one not sufficiently addressed by the existing support structures. Organizational technology support, primarily in the form of help desks or customer support centers, is increasingly unable to meet the needs of the organizational members. Not surprising, the 1997 Help Desk and Customer Support Practices Report reveals that newer complex technologies, changes in hardware and software (upgrades, conversions, new installations), and increased numbers of users have all led to increased support requests. The initial web based-survey for this case study revealed that the mainstream faculty use a variety of sources to obtain technological assistance. Besides going to the help desk or computing services, faculty who need help call on students, administrative personnel (secretaries and staff), spouses, colleagues at other institutions, and to specific colleagues within their respective departments. An analysis of the patterns of communication within their academic units revealed three individuals (two at Coastal and one at Inland) who were the central loci in the department for technological assistance. Faculty in both departments get their technological assistance from a small number of colleagues rather than from the technical support systems of the universities in which they reside.

Both institutions in this study retain a centralized help desk support system, but both IT administrators note that this help desk arrangement does not adequately meet the needs of the faculty in all areas of technological support. While the ITAs speak positively about the ability of the support structure to meet the needs of the faculty, the techno-profs
and deans are less satisfied. The Coastal ITA is guardedly optimistic about the effectiveness of the support offered at his institution.

How effective is information technology support? There are two ways of answering that. One is technological support and the other is academic training support. I think [Coastal University] is good in both areas and improving rapidly. There’s still a way to go and we’re not where we should be, but we are certainly further along than many schools if not most.

The ITA at Inland University was blunt in his assessment of the effectiveness of the support structure at his institution. "It wasn’t effective at all when I came here, which I think is the reason I came. I think we are moving fairly quickly, I think [the faculty] are satisfied with what they are getting now."

The use of departmentally-located technology support personnel (Departmental Liaisons) is an attempt at Inland to assist faculty integrate technology into their teaching. They are not intended to assist faculty with more basic hardware and software issues. The idea, though, is that the Liaisons will not perform basic technological assistance for faculty, that function is still reserved for the help desk. The help desk at Inland has been renamed the Technology Service center primarily because "the help desk wasn’t any good so we had to disassociate the name".

A similar system is being implemented at Coastal university where the overburdened help desk system will be enhanced by the use of Technological Support Persons (TSPs), technologically-adept individuals who are housed within various sections...
of Colleges throughout the university. The intent of the computing center, which employ and train these TSPs, is to provide a first line of assistance to the faculty, at the individual, departmental, and college levels. Unlike their counterparts at Inland, the Coastal TSPs are expected to assist faculty with any and all questions related to technology. The TSP program has only recently been initiated within the College of Arts and Letters. A senior ITA at Coastal said "we expect the TSP’s to answer 100 questions before faculty ever have to call over to the help desk."

To address the shortcomings of a centralized support system, both institutions have adopted a variation upon what has been termed a "campus computer associate" or "instructional technology consultant" at other institutions (Chronicle, 12/11/98, p.A35). The departmental liaisons at Inland are intended to be a hybrid of both computer and disciplinary expertise within the college or department in which they reside. At Coastal, a less ambitious tack is taken and the technology support persons are generally undergraduate or graduate students in computing sciences. The efficacy of these individuals is variable and appears not to have a significant impact upon the use of techno-profs at either institutions. Faculty still prefer to go to other faculty, specifically the techno-profs, for assistance with day-to-day problems and questions regarding technology. For the techno-profs providing this assistance is outside of their prescribed duties. The acts they provide are those of good citizens. They are helping behaviors provided without promise of reward or recognition, outside of the control of the reward system that monitors the fulfillment of their academic duties.
Recorded Control

Most of the actions of the individuals within an organization are motivated by organizational commitment and organizational affiliation. Given a choice, however, most individuals would prefer to pursue individual goals rather than group objectives (Ahrne, 1994). To ensure that the affiliates of an organization pursue the objectives deemed worthy and necessary by the organization, control of the affiliates is a required. Individuals concede control when they decide to become affiliates of an organization in exchange for access to resources they would not otherwise be available to them. Control is also maintained by ensuring that the relevant performance of affiliates is delineated, recorded and ultimately either rewarded, when appropriate, or sanctioned, when performance is not acceptable. Organizational control is accumulative and directed towards the performance of each individual over a long period of time (Ahrne, 1994).

In a university setting, authority and control are ostensibly shared, but ultimately individual affiliates are rewarded or sanctioned (as with the awarding of tenure) based upon criteria set at the university, college, or department levels. The services that the techno-profs provide are not typically part of annual review process nor are they part of the promotion and tenure process.

In Technology, Education, and the Changing Nature of Resistance, Wendy Rickard (1999) interviewed five Educom Award Winners (given for outstanding contributions made to improve undergraduate education through information technology) regarding the characteristics of faculty resistance to using technology. Faculty resistance to technology was once primarily due to a fear of change, or the belief that the use of
technology in education was only a passing fad, but is now due to other, deeper factors. The panel of experts assert that institutional support of technology goes beyond merely providing faculty the latest desktop hardware, or assistance in setting up web pages, that true support includes faculty-friendly policies on intellectual property and fundamental changes in the academic rewards system. These barriers are not exclusively administrative however, as Award Winner Paul Vellman of Cornell notes:

The barriers that keep such [technological] work from advancing careers are not generally institutional. Promotion in academe depends upon the evaluation of one’s work by one’s peers. If the other members of the faculty think that someone who develops information technology-based teaching materials is just a programmer, or the work is just teaching and not research, then they will judge that work to be undeserving of promotion and tenure. (Rickard, 1999, p.2)

The general consensus from the group of experts is that institutional cultures must change if technological work is to be valued and rewarded.

The cultures of technology are very different at each of the two institutions studied. Coastal University has a rich and relatively lengthy history of success in incorporating technology into the teaching and learning parts of its mission. A substantial portion of the enrolled students are commuters and are non-traditional age. While retaining a large, traditional student population during the day, the institution also reaches out to a burgeoning number of night, weekend and distance students across the state and nation. The university offers satellite-delivered televised courses to thousands of students...
across the state, and to students aboard military ships at sea. It also offers video-streamed courses as well as web-based courses and programs. The Mission Statement for Coastal is explicit in delineating its desire to be a leader in technologically supported higher education:

As a national leader in the field of technology-delivered distance learning, the university strives to enhance the quality of the educational experience, wherever education is delivered, by applying emerging technologies. It also supports research to explore the impact of these technologies on the teaching-learning process. By utilizing these technologies and by partnering with institutions of higher education, corporations, and governmental entities, the university is able to provide undergraduate and graduate degree programs to students across time and geographic boundaries. ([Coastal University] Board of Visitors Manual, 2000, p.2).

The ITA at Coastal spoke of the general culture his university as one where faculty are willing to accept change, to try new things and new technologies more easily that one would expect at a more traditional institution.

We're a non-traditional [university], we're not steeped in tradition. Faculty don't come here to teach "9 to 5, Monday through Friday". They are not part of town and gown. You're going to teach in the evening, you're going to teach older students, and they're not going to be full-time students.

The culture, according to the ITA, is that one in which faculty can "push the envelope' and offer instruction using various technologies to students who otherwise wouldn't have
access to a college education. Some pockets of resistance exist, however. The Dean at Coastal noted that when he tried to change the name of the college's computer committee to include the word "technology", it was met with great resistance and debate. Faculty were hesitant, even during a time when great strides were being made incorporating technology into the curriculum, to make a change that might imply that technology might alter the traditional role of the faculty member in the classroom. The original Computer Committee existed primarily to make recommendations as to what desktop computers the college should buy for faculty and labs.

When I came here I said 'we need to change the name [of this committee] because we are not just talking about purchasing computers. We really need to be looking at technology [as a means to transform the way we interact]. It was amazing the debate that went on - it was actually an issue!

At Inland University, a very different culture pervades the institution. No such comparable section is found in the mission statement for Inland university. Rather, its mission boasts a 'distinctive history' and learning environment that 'fosters close interaction among students and teachers' ([Inland] University DataBook, 1999). The Provost, in an address to the faculty in 1998, said that

[Inland University] will continue to exist because 18 year-olds will always want to leave home and their parent will always want them to leave home. Distance learning, whether of the more traditional kind provided first by radio and then through televised courses, or of the newer kind provided by two way audio-video or over the web, is that they appeal not to the
The Provost finished by encouraging the faculty to think how the use of technology fits in with the mission of the university and how it can enhance the personal learning experience and intimate learning environment so valued at the institution.

The ITA reiterated the Provost’s sentiments noting that "we are a residential liberal arts institution. Our goals are different from [another institution], a place with a lot of commuters, or more nontraditional learners. We have to think of where technology adds to that and does not detract from it." The traditional nature of Inland has tended to retard its forays as an organization into technology. The ITA explained that "this campus is still pretty young in terms of technology, and by young I mean immature, they have only had networking here in the true sense of the word since 1996, and what that means for a faculty is--if you are five years behind, you are light years behind."

The culture of technology is changing at Inland, however. Faculty use e-mail, word processing and the web with regularity. The ITA feels that part of his role at the university is to help faculty to adopt more advanced applications and use technology at a higher level. Essentially his job is to "raise the baseline, raise the bar." It is not that the institution has a non-technology culture, but that a perception exists among some administrators, faculty and the public that the university has a non-technology culture,
and, he admits, "perceptions help build cultures. It would make my life a lot easier if it wasn’t there."

His job is made easier by the existence of a "surprisingly modest-sized" group of faculty who are technologically proficient. They form a subculture at the university who have vigorously adopted technology and he hopes to use them to "build enthusiasm, generate curiosity" within the ranks of the mainstream faculty. "The [technologically proficient] are the real focal points for changing how other people look at technology and get it into the curriculum and in their courses, because I think that there’s a natural distrust of the administrators, so you use those folks who other faculty trust, which is, their peers." One of Inland’s basic problems, notes the ITA, is that "we are so traditional, so historic that a lot of our students don’t believe we can do this kind of [technological] stuff."

The cultures of both institutions regarding technology are in general, dichotomous. Coastal has embraced technology, having recently made technology a key part of its mission and by extension part of its general education curriculum. In a report sent to the state coordinating council ([Coastal University] Report, 1997), the administration at Coastal claimed that 50% of faculty had received training in the use of instructional technology and that the remaining 50% would be "technically-literate" within one year. Inland university has no such goal. Although the number of technologically adept faculty at Inland is not "unsubstantial," according to the ITA, technological literacy among faculty may be desirable but is not heavily promoted. Adoption and implementation tend to be self-directed and initiated at the individual
faculty level. In the final analysis, if faculty at either institution decide to engage in technologically oriented, innovative work, they must do so within the guidelines of the traditional review system if they hope to reap the rewards of promotion and tenure.

Control - Annual Reviews and Promotion and Tenure

The criteria for evaluation and promotion and tenure at both institutions are strikingly similar, albeit not surprising since both are doctoral institutions within the same coordinated state system. At Inland University, the criteria used for evaluation, retention, promotion, and award of tenure of faculty include: responsibilities for effective teaching, significant contributions to their field through research, scholarly activity, and professional service ([Inland University] Faculty Handbook, 1999). Each unit (school or faculty) at Inland further defines its own criteria for promotion and tenure.

At Coastal University, the Faculty Handbook (1999) describes the evaluation process and criteria, permitting some latitude to the faculty member and the evaluators:

"A regular review of the performance of all faculty members will be conducted in order that they may receive full credit and review for their contributions to the university and to their disciplines. The three criteria on which this evaluation will be based are teaching, research, and service. All faculty members will be evaluated on the basis of teaching, research, and service. The weighting of these three areas will vary from one faculty member to another depending upon the needs of the department and the particular accountability of the individual faculty member in contributing toward the fulfillment of these needs." (p.14-15).
The Handbook also notes that the category of professional service is more difficult to define that the other areas but that it "deserves the same kind of rigorous evaluation and positive credit" (p. 15). This lack of specificity concerning what service is has allowed technological contributions a small opening within which to enter into the promotion and reward system. The dean at Coastal provides an example of service work related to technology and how it has provided invigoration to a senior faculty member:

On the other hand, there’s another person who has been around for years who teaches two courses that are now entirely technologic.....and has totally reinvigorated him, it has reinvigorated his teaching, it has reinvigorated his service role within the department, but also in the college--and it’s been amazing-- to me, to see!

The dean is candid, however in his assessment of the value of service in promotion and tenure decisions for junior faculty, regardless of the inclusion of technology or assistance to one’s colleagues:

Service is something they [faculty] ought to be engaged in to the best of their ability. Now, should I therefore count it more than research and teaching if they do a bunch of it? No. And some faculty don’t like that idea. By giving 100% and 5 times as much as Joe Schmo down the block in service why shouldn’t I have service count more on my evaluation? And I say..."because there are three categories." And teaching and research are the most important things that we do. Without that the university has no credibility. Service is something we need to run the
university but it isn’t the core of what we do.

What accounts for service, however, is ambiguously defined, not easily recognized, and often not highly valued. For most faculty, their service activities fall within three main arenas, 1) service to the department, college, and university (generally through committee work), 2) service to the profession or discipline (often through elected office or work on professional committees) and 3) service to the community (a broad group of activities performed primarily to help the general public). The daily, ongoing assistance that techno-profs provide does not neatly fit into any of these categories, although the service they provide certainly benefits the department, college, and university. So, why do techno-profs provide assistance to their colleagues? The dean at Coastal was succinct: “they’re good citizens”. Organ (1988) notes that good citizens do not merely rest upon compliance with organizational rules and job descriptions, "he or she does something more to promote the community" (p. 22). In this case, techno-profs, by acting as the resident departmental experts in computing, go beyond mere collegiality and provide a wide range of support and assistance, they fill the gaps left by an overworked and insufficient support system.

Rewards- Intrinsic

Techno-profs are rewarded through a variety of means by the organization, even though the attainment of material rewards appears not to be their primary motivation for their good citizenship behaviors. The intrinsic rewards they receive include a heightened self-concept, a feeling of prestige, driven by the desire to be seen as an ‘expert’ within the department and organization, and the self-satisfaction of helping others. Although
primarily motivated by these intrinsic rewards, their motives are not entirely altruistic.

Professor Gray helps others because he like to be useful and feels that he is making a contribution to his discipline whenever he helps a colleague learn to employ technology within the field. He also believes that the department as a whole achieves higher status within the college and university, even within the state when his colleagues incorporate technology into their teaching. Gray, reflecting on the reasons he provided assistance to his colleagues in the past, said:

> It used to be if it was going to get done at all, I mean if the printer was going to get hooked up - I had to be the one to do it... just wasn’t anyone else to do it but, now there is.

His reasons for assisting faculty today are quite different and more personal:

> I just think it’s useful, it’s exciting. I mean there are so many ways technology can contribute to what we do. Particularly in Languages- that I just feel I like to disseminate that. I guess I’m kind of like a preacher or something. I am more interested in doing some of my own projects and if anybody else finds them interesting I am glad to [help], you know. I am not as altruistic as I used to be.

At Coastal, Professor Green provides his citizenship behaviors mainly to feel connected to the department, to hone his teaching skills, and to get ideas for his research. He provides assistance partly because he was often helped by others while he was a doctoral student and now wishes to continue that "circle of support" as a full-time faculty member.
Reflecting on the reasons he provides assistance, he considers his graduate school experiences as key in the formation of his attitudes towards helping others.

A lot of it came from my graduate school experience which was a very small group. We tended to get along really well with ourselves, it was a very little kind of support community—each of had different emphases, different areas of expertise and it was always very supportive and communal in a lot of ways. It was never as mercenary as “if I do this for you then you owe me a favor.” It was always kind of “I’m going to do something for you because I know down the road sometime you’re going to do something for me.

His current motivation for providing assistance is that:

Personally, I like to feel connected. I like to feel like I’m actually a member of the department, I teach most of my courses at night, but I’m here during the day and I help out as much as I can and it just makes me feel like I’m part of things, so for me I guess that’s one of the advantages, but it’s a very easy kind of way to integrate myself socially into the department.

Lastly, he considers his abilities to help others a talent he possesses:

I guess I think, without sounding like I’m bragging, I do a pretty decent job of it. And, it’s something I’ve really had to take a lot of time and pay a lot of attention to—I can’t just say here’s HTML—go learn it. Making that transition from an intuitive learning style on my own to a more explicit
teaching style. I think I do a good job of it - I think I have a sense of how to show someone how to do something.

Instructor Young, also in the English department, provides assistance to his colleagues for different reasons. Instructor Young, although as the director of a computer lab, a portion of his job is related to technology, he is primarily a lecturer in the English department. He has assumed a more administrative role over the past year in that he oversees the departmental computer lab. By taking on this role, he was given a course release which permits him more time to pursue other technologically-related projects. Although he no longer runs the day-to-day operations of the lab, he is still sought out by his colleagues for help with their technological problems. He describes himself as a "helpful person by nature" and provides assistance to others primarily to make himself more valuable to the department. In making himself valuable to the organization, he hopes that they will retain him beyond his six year contract in some capacity, if not in his field, then at least within a technological capacity. When asked why he provides assistance to the faculty who come to him, he remarked:

Because I’m selfish in a way. I want to make myself valuable to the institution and employable, and hopefully have a career here. I also think I’m a helpful person by nature, I like to help people, I respond to need. I’m a sucker maybe?

Rewards - Extrinsic

The extrinsic rewards that techno-profs receive run the gamut from simple to valuable material rewards, that is, gifts and supplies beyond that which a regular faculty
might receive. They include thank you notes, a pat on the back, released time, the first crack at pilot projects, and salary increases. All three techno-profs noted that they possess the newest or most powerful computer in their respective departments. They are able to parlay their technological status as the departmental expert into the latest computing systems, newest and most sophisticated software, and advanced training. The departments benefit by having faculty who are willing to try new equipment, test new software, and pilot new applications in return.

Although the techno-profs provide their OCB overtly for intrinsic reasons, they also each expressed a desire that their behaviors be recognized and rewarded at much higher levels, including continued employment, promotion and tenure. Although both institutions acknowledge the contributions made by the techno-profs to the organization, these voluntary contributions are not really rewarded within the existing promotion and tenure process.

The use of technology is valued at both institutions, but its use must fall within the guidelines of the traditional teaching and scholarship activities. At Coastal, techno-prof behaviors can be included as part of the review process. However, these activities are less salient. Only if the other parts of the promotion and tenure equation, namely teaching and scholarship, are present will the technology-related contributions be considered. The culture at Coastal has evolved such that innovative technologically related work can be an important factor during promotion and tenure decisions. Citing a recent example, the dean at Coastal said:

There was a case in point where a faculty member came up for tenure this
year with good service, outstanding research but his teaching evaluations were not as high as our college likes to see, because we have very high expectations for teaching. So this person was on the "cusp" there, but the use of technology—it really made the difference. In my own view it made a tremendous difference. I supported this person enthusiastically. The use of technology could have a small to medium to significant impact depending on the circumstances. But, I would say in no instances does it go unnoticed.

The ITA at Coastal reiterated this point, noting that while it is not intended to so, in several cases, the use of technology made a significant impact on a tenure and promotion decision:

I think the Provost would say that there are ample opportunities for faculty to present evidence of successes using technology in teaching classes. The process is there for them to include that data. Faculty are not given or not given tenure based upon that one specific piece, but as part of the overall evaluative process. It is taken quite seriously. It has indeed, brought the decision making role into the positive category on a number of occasions, but it's not intended to do that.

Typically within the College of Arts and Letters at Coastal, salary raises are based upon faculty efforts divided in the following manner: 40% teaching, 40% research, and 20% for service. The dean stated:

Teaching and research are the most important things that we do. Without
that the university has no credibility. Service is something we need to run the university but it isn’t the core of what we do. There are some [faculty] who love to do service, but we can’t let them off the hook. And so, if the person is being the "tech guru" in the department "well then heck department chair, don’t put him on ninety other things. Let this person do that mainly for their [service]. Now the problem there, going back to one of your questions...if they don’t have the official title some of that, it’s true it probably doesn’t get the recognition that it deserves because [when] you list the things that people do... you don’t list "guru".

At Inland, a strictly traditional approach towards promotion and tenure is in effect. Rewards come from the profession, meaning evidence of scholarly activities within the profession such as publications, grants and research are reviewed by a faculty member’s peers within the discipline. The use of technology may be adjunct to that work, but technological efforts are generally not rewarded per se. The dean there said:

Yes, I think [techno-profs] are rewarded. But no one would protest their annual salary increase because their techno contributions were undervalued. The rewarding of technological work varies according to department, but they must do traditional scholarship. I do think that there’s going to be a profound debate in the next decade. It’s going to revolve around the nexus of issues that I would call electronic publishing. The implications of electronic publishing, like intellectual property issues. There are going to be access issues. There are going to be ephemera
versus permanence issues. There are going to be issues of what constitutes peer review, what constitutes the culture of scholars...and all of this is going to feed into the tenure, promotion and rewards system.

The ITA at Inland was more blunt, noting that no formal recognition for being technologically proficient exists at Inland. Being the techno-prof has no effect during promotion and tenure process.

You won’t get tenure here if you’re not a good teacher, an excellent teacher, in fact. I am also a firm believer that you don’t need to have technology to be a great teacher. I had a lot of great teachers, you did too, that didn’t have a computer.

So at Inland, the culture is one which values the traditional campus-based, “sage on the stage” form of higher education. That is not to say faculty do not use technology in the delivery of the education at Inland - they do, but they value the interaction with students exceedingly highly.

The Provost, in his address to the faculty in 1998 spoke of the challenges of distance education and the use of technology at Inland:

In this ‘Information Age’ it is all too often forgotten that information is not the same as knowledge, much less the same as education. It is undeniably true that some aspects of higher education and many institutions are going to be profoundly changed by technology. There are more and more of us using the computer as an aid to instruction - this change has been produced by the realization that the computer need not
replace the personal learning experience that takes place here, and in which we take such pride, but it can enhance it.

(Provost _______. 1998, p.2)

Not surprisingly, neither institution holds the service requirement in high regard during annual reviews and promotion and tenure decisions. It follows that informal service such as that provided by the techno-profs would be even less recognized and rewarded. In the long-term review of a faculty member's work, OCB does not go unnoticed, but if it does not fit into the categories of teaching and scholarship, it does not count for much.

The institutions are very different in their makeup and missions. Both, however, find themselves in an environment which the state is promoting technology as a way to cut costs and to reach new learners. Both institutions find that their incoming classes of students increasingly are expecting to be taught with technology. Coastal has a pro-technology culture and an administration that advocates technological advances and the incorporation of technology into the curriculum, for both on-campus and distance learners. Inland University seeks to retain its traditional faculty/student relationships and find ways to use technology as a tool to enhance an already successful student experience. It does not wish to replace the existing learning environment. Both universities must expend their resources wisely to achieve these goals. Within these environments are the techno-profs, the technologically proficient faculty who are assisting their colleagues on a daily basis.

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Substitutability

Ahrne (1994) notes that the recognition and identification of individual affiliates is indispensable for the effective running of an organization, yet the paradox of organization is that no individual affiliates can be indispensable. The leaders, the most popular, and the most talented members can and eventually must be replaced if the organization is to survive. Organizations presuppose and transcend individual actors. Ahrne (1994) further asserts that individual affiliates act as 'centaurs', that is, they are a combination of actions partially on behalf of the organization and partially for their own human half. Affiliates receive resources, jobs, tasks, goals, motives and knowledge from the organization, but the individual supplies the thoughts, actions, feelings and personality through which the work of the organization is performed. The actions of affiliates are some combination of actions on behalf of the organization and of the individual. In this case, the affiliate who is a good citizen (the techno-prof) goes above and beyond his prescribed role to assist his colleagues. The actions of the techno-prof benefit not only individual affiliates but also the organization as whole, even to the detriment of his own career.

At both institutions, new faculty are hired primarily for their disciplinary expertise and education. They are not routinely asked during the hiring process if they possess any technological proficiency. New hires are expected, however, to have a certain level of technological expertise including the ability to use e-mail, word processing and some ability to use the Internet or World Wide Web to obtain information. The dean at Coastal said "I would be flabbergasted if I thought someone couldn’t do e-mail, in any
[disciplinary area], no matter how esoteric." The proficiency line is drawn at the World Wide Web, however. "Would I like everybody to be able to make a web page? Absolutely. [But] I don’t know how to do it, so I wouldn’t expect that [of faculty]. Do I want somebody in every department that can do it? Yes."

The dean at Inland was taken aback by the question and noted that he never really considered asking someone about technological proficiency during an interview. He did assume, however that any new hires would come in "with word processing and e-mail skills and be able to use web-based library resources". Thus, both institutions assume that new faculty possess a minimal amount of technological skills when they arrive.

At both universities the techno-profs, as a group and as individuals are recognized for what they do. When asked how valuable the techno-profs are to the institution, the deans at both universities were quick to respond that the techno-profs were "invaluable" or "exceedingly valuable" members of the faculty ranks. Both deans estimated that no more than 10% of their faculty would be considered techno-profs. For Coastal University this amounts to approximately 20 faculty, and about 35 for Inland University.

The ITAs are split on their estimation of the value of the techno-profs. At Coastal University the techno-profs are viewed as invaluable members of the institution; they are used as mentors, role models, and examples for the mainstream faculty to see how technology can be incorporated into their teaching. Coastal’s ITA estimated the number of techno-profs to be about 30% of the total faculty members, while his counterpart at Inland University estimated about 5% are techno-profs at his institution.

At Inland University, however, the ITA holds a different view of the value of the
techno-profs. He indicated that while they might be valuable individually "as a human being", faculty who provide technological assistance are, he feels, a waste of a faculty resource.

I think that if they are being used in that way, there's not a lot of value there. If I look at the total value of a person, if I have a person who's been trained for 'x' number of years and he’s teaching people how to indent paragraphs—I’ve just wasted an awful lot of resources that could be working on what they should be working on, teaching and scholarly activities. It's a very bad use of a very expensive enterprise.

While this attitude is prevalent at Inland, at Coastal the use of a faculty position as technology assistant is deemed worth the "expense" to ensure that the College keeps up with the diffusion of technology throughout the College. At Coastal University, where a large administrative push has been made over the past three years to incorporate technology into the curriculum, the dean explained that "the needs of this college are tremendous. I have decided to take a faculty member and give them release time [to act] as the Technical Support Person. They will run the [computer] lab for the college."

The techno-profs are valuable members of the departments, the colleges and the universities that employ them. Ahrne (1994) reminds us that no one affiliate of an organization can be irreplaceable that for the organization to survive the long term, even the most knowledgeable and the most valuable affiliates must be substitutable. Ahrne (1994) further warns that substitutability requires that affiliates must be replaceable in both short and long term scenarios. That is, an organization must be able to continue to
operate effectively even if an affiliate is ill, or leaves for a short period of time. No single affiliate must possess such unique information, or be so valuable, that the organization cannot continue even for a short period without the presence of the affiliate member. A long term scenario would mean that the position an affiliate holds must transcend the individual who holds the position. If an affiliate leaves the organization after having worked there for an extended period, again that affiliate must not be so valuable that the organization cannot survive the loss of that individual over the long term.

Since the techno-profs are recognized for their technological expertise, they are often placed on technologically-oriented committees. In fact, they tend to get placed on virtually every technologically-oriented committee, to the exclusion of all other faculty. Both deans recognized that the techno-profs run the risk of becoming exhausted by serving on so many technologically oriented committees. The Dean at Inland University sees them as being analogous to another situation. "They are like the poor minority faculty member who gets on every committee because you’ve got to have a diverse committee. You see the same faces [on the technology committees]. It’s like [the movie] Casablanca--’round up the usual suspects.’" To avert this problem at Coastal University, she recommends to technologically proficient faculty, specifically the newer, untenured faculty, that they learn to say "no" to excessive numbers of committees during the time in which they should be concentrating on their teaching and scholarship.

**Faculty Work**

At both institutions traditional definitions of scholarly work reign. Faculty members are expected to divide their time among the traditional faculty pursuits of
teaching, scholarly activity (research and publication), and to a lesser extent, service. At Inland University promotion is based upon the evaluation of creative scholarly work both by colleagues and by administrative officers ([Inland University] Faculty Handbook, 1999). The normal load for faculty teaching at the undergraduate level at Inland University is nine credits per semester and at Coastal University the usual load is twelve credits. Both institutions recognize that the modes of scholarship are varied and diverse, but that scholarly work must be subject to peer scrutiny and evaluation.

Although the use of technology is expanding at both institutions, the review and reward system makes only slight mention of technological work as rewardable activity within the promotion and tenure policies. The dean at Coastal University notes that although technology has made significant changes in what faculty do in some departments, for many others the definitions of the criteria for teaching, research, and service "have not changed very much". Likewise at Inland University the dean spoke of traditional faculty work s the norm. "I don't think we've had a case where somebody hasn't done traditional scholarship and has done technological things [for promotion and tenure]. They do both." The ITA echoed these sentiments. He noted that excellent teaching was a primary expectation at the institution. "You won't get tenure here if you're not a good teacher."

In summary, then the traditional view of faculty work is seen as encompassing teaching, scholarship, and some level of institutional, disciplinary, or public service activity. The techno-profs however are providing a service to the university community by providing unique and continuous assistance to their colleagues. Their collegial
mentoring and assistance, however, is not significantly considered during annual reviews or promotion evaluations.

The Behavioral Dimension

The behavioral dimension comprises the dynamic individual, interpersonal, group and intergroup behaviors which occur within a organization. It is the link between the structural dimension of the structural organization as described by Shirley and El-Ansary (1976) and the interactive elements of an organization as described by Ahrne (1994).

*Individual behavior* refers to the beliefs, values and attitudes relevant to an individual affiliate who is a member of the organization, in this case the behaviors of the techno-profs. *Interpersonal relationships* refers to the interactions between two affiliates as tasks are accomplished within the organization, in this case the networks of individuals to whom the techno-prof provides assistance. For this case study, the individual and interpersonal behaviors are the organizational citizenship behaviors the techno-profs direct towards specific individuals within their departments (OCBI). *Group behaviors* are those that occur between clusters of individuals who interact as a single unit and *intergroup behaviors* are the actions which occur between two or more work groups. In this case, group and intergroup behaviors are melded into the organizational citizenship behaviors which benefit the organization as a whole (OBCO).

The Mainstream Faculty

The deans at both institutions likewise felt that technology has definitely affected their Colleges, however they noted that the impact has been idiosyncratic. Some disciplines, they note, (computer science, physical and applied sciences) have used
technology as part of their teaching, research, and curriculum for thirty years so there exist groups of faculty who have been surrounded by technology. On the other hand there are also disciplines and departments where the incorporation of technology has been slower to diffuse, namely the humanities and arts. That is not to say all faculty within the sciences are technologically proficient nor that there are no techno-profs within the art department.

Giving an example of the transformational effect of technology, the dean at Coastal cited the English and communication departments in her college.

There is a whole new generation of faculty who have been brought in primarily in the last three to four years who are very proficient with technology. It is changing the way these areas are taught. Curricular expansion has come about as the result of two very low level hires, if you like, brand new hires, but people with so much expertise that the Chairs now feel confident that the department as a whole can commit to transforming technologically a lot of their curriculum. Those of us who are observant where academe is heading cannot help but realize how quickly this is all transforming the way we interact. And I have to say that the way I conduct business as a scholar and as an administrator has changed significantly in the last five years as well.

At both Coastal and Inland, the mainstream faculty are using technology for word processing, e-mail, and access to the Internet, with some pedagogical uses within their discipline. In this respect it has made faculty less dependent upon administrative or
secretarial staff, but has shifted the work normally done by these individuals onto the faculty role.

Despite the existence of the TSP's, the help desk remains the core assistance provider for many at the university. The techno-profs, who are often as technologically competent as the TSP's, generally have their own support structure, usually specific individuals both within and without the campus computing community to whom they go for assistance. The techno-prof at Inland does use the Campus computing center, while the techno-profs at Coastal typically avoid the use of the help desk and Computer Center altogether. Professor Green at Coastal voicing his doubts that the current support system can provide him assistance, notes

[The Computer Center] is stretched so incredibly thin on this campus. It takes far longer to get problems addressed. If [the center] was larger, with a much shorter response time, I might be more inclined to call them more often, to use them, but I know that they are so overburdened that my first instinct is to try and figure out something on my own.

Likewise, Instructor Young has stopped using the help desk almost entirely.

I used to go to [the Computing Center] for help and became increasingly frustrated that I wasn’t getting the kind of help I needed which in turn made me look bad with the people I was serving. I mean there’s no real academic computing center here. The [department that does exist] seems to service the television courses, but there’s not someone, there’s not a clear person you can go to if you’re a professor who needs help.
Summing up the lack of faculty support structure, Instructor Young lamented

The Computing center is very technical, and they deal with mainframe and hardware and stuff like that, and they’re not good at pedagogical concerns. The other centers are small and seem extremely focused on higher end technology. Your average [faculty member], the majority of faculty, are not served at all.

**The Techno-profs**

Within the framework of Ahrne’s concept of an organization there are the mainstream faculty, arguably one of the most important and valuable groups of affiliates to comprise the organization. Within this large group of affiliates, there exists a smaller group of faculty who are technologically proficient, and are sought after for their technological expertise by both their colleagues and their superiors. By providing assistance at the individual level they assist in the diffusion of technology across the institution. Organ (1988) defines organizational citizenship behaviors as individual voluntary behavior that in the aggregate aids organizational effectiveness but is neither a requirement of the individual’s job nor directly rewarded by the formal system. The OCB’s exhibited by the techno-profs fulfill this definition.

The dean at Inland describes this unique faculty member, the techno-prof, who has achieved a level of technological expertise and is willing to help his colleagues:

I think we now understand, most of us understand, that there is a kind of a faculty member who is very technology comfortable, very technology based, who can provide [assistance], who can do things that we can’t do,
and can provide a level of enrichment to other faculty and students. They are no longer just the guys that help me when my hard drive crashes. They’re now somebody that can make me a better teacher or maybe a better scholar.

The techno-profs provide a valuable resource to their respective departments by helping their colleagues with technological problems. Although the assistance they provide is not typically part of their assigned duties, they provide such assistance for a variety of reasons. For the techno-profs, providing assistance has both altruistic as well as tangible benefits. Professor Gray helps others because he likes "to be useful", he enjoys helping other faculty incorporate technology into the discipline almost "like a preacher" to proselytize the use of technology in his discipline. Professor Green assists others as more of a "Golden Rule" ethic, as an example of a "circle of support", wherein:

I’m going to do something for you because I know down the road sometime you are going to do something for me." Faculty come to me because I do a decent job of it.

The junior faculty, Professors Green and Young, provide assistance for personal as well as professional reasons. While they both consider themselves "helpful" people, they also seek personal validation and recognition. Professor Green provides assistance for more social and political reasons, by coming to campus during the day he can help others out, but also be a more active part of the social aspects of the department.

I like to feel connected. I like to feel I’m actually a member of the department. I teach most of my courses at night, but I’m here during the
day and I help out as much as I can and just makes me feel like I'm part of things. It's a very easy way to integrate myself socially into the department.

Instructor Young also provides assistance partly to enhance his own career at Coastal:

I am selfish in a way. I want to make myself valuable to the institution and employable, and hopefully have a career here. I like to help people. I respond to need. I'm a sucker maybe?

The institution responds to the techno-profs' behavior in more tangible ways by providing them with resources. Every techno-prof noted he had the best or latest computer equipment in the department, the latest software. They noted that they got what they asked for and were usually the first to get such technological material. Instructor Green added that he also benefitted from his status as the techno-prof by being in touch with visionary kinds of work, new applications and exciting projects.

Being the techno-prof is also a drain of resources from the both the institution as well as from the faculty members who provide such assistance. The IT Administrator from Inland feels that faculty who are providing their colleagues with mundane technological assistance are an enormous waste of resources, mainly in time taken away from more important pursuits.

I think, that if they are being used in that way, there's not a lot of value there. If I look at the total value of a person, if I have a person who's been trained for 'x' number of years - and he's teaching people how to indent paragraphs, well I've just wasted an awful lot of resources that could be
working on what they should be working on - teaching and scholarly activities.

Both Professor Green and Young complained of the fact that providing assistance was so time consuming. Each spoke of rearranging their schedules to get work done at home or on weekends to make time available during the day to get their work done. Instructor Young spoke of being over burdened with requests for help, so much so that he had "physical reactions to the stress, it was unbelievable." Describing the times when he felt overwhelmed by being the techno-prof, he related:

People would come in completely freaked out because they are on a deadline, they couldn't figure out how to do something, and I would be preparing for a class or something or meeting with a student...people tend not to make appointments or concern themselves with my schedule. Too much is expected of me – I find myself encountering unreasonable demands and expectations.

Professor Green, as one of the newest faculty members of his department, teaches most of his classes at night. He comes to campus during the day for a number of reasons, to meet with students, to be 'seen" by his colleagues, and to help them with technology-related problems.

I don't come to school at nine o'clock with eight hours of work I need to accomplish by five. Instead I do most of my work at home at night. I do a lot of it on weekends when there aren't people around. I understand that I need the time when I am around the department during normal working
hours I have to be a little more flexible.

On one hand the techno-profs provide a convenient source of technological expertise located at the source of faculty work. Yet it is also a drain on the department resources as the techno-profs have to take time away from their own work to provide such assistance. Both Professors Green and Young have felt overwhelmed at times with requests for help and have learned how to say "no." They all spoke of juggling their own tasks and work schedules in order to provide more time when asked to help others. The techno-profs at Coastal, Professors Green and Young, provide between two to five hours of assistance per week. Professor Gray, who does not feel over burdened also provides two hours per week. All three felt the amount of time spent helping other faculty was decreasing because of Information Technology help, but that when new machines, software or applications arrive, the amount of time increases.

Techno-profs provide a valuable resource to the departments and institutions by providing a wealth of expertise on Technologically Oriented Committees. They serve on numerous departmental, college and university level committees, and have all chaired several at their respective institutions. Occasionally the techno-profs are assumed to be more technologically proficient than they really are, and are placed on committees beyond their expertise. Rather than ask to get off the committee, they tend to accept the challenge as an opportunity to learn more and rely on their network of technological contacts to get the expertise needed to assist others when the need arises.

All three techno-profs were hired primarily for their disciplinary expertise. The techno-profs at Coastal were hired in part due to their possessing technological skills as
well, Green in electronic writing, and Young in computer assisted instruction. So for professor Green and Instructor young, they are expected to incorporate technology into their teaching and scholarly activities. Because they are technologically oriented they have become readily identified within their department as the persons to go to for virtually any and all technological problems. The line between what they are supposed to do for the department and what they provide in non-required service as organizational citizenship behaviors has become blurred. Professor Green notes that although he was brought in to teach, to perform scholarly research and to provide service, assisting a faculty member with a printer problem is not out of the ordinary:

It's a collegial part of the job. I think that in the academic environment there's not much separation that's made.

Instructor Young was hired to be a teacher, but also to introduce technology into the curriculum. As it turns out his technology role "happened very quickly" as the university is making a big push to bring faculty and student technology use along at a fast pace. He was quick to note however that he definitely does things outside his role, that he helps others when they either can't or won't get help at the Computer Center.

I tried to make up for what [Inland Computer Center] wasn't providing. I felt personally responsible.

The assistance Professor Gray provides is also "not listed as part of my job duties. It is not part of my role here." he would prefer that it be part of his role at Inland, and in fact has applied for several positions that had technology as part of the job, where his role would be part information technology, part faculty. In hindsight, he notes
I’m probably better off not having gotten it. They were really looking for somebody at a more lower level of education.

The techno-profs are glad to provide the assistance they do, Green and Young consider it a large part of what they do. Green, in a tenure track, believes his technological abilities permeate all three areas of his work as an academic, teaching, research and service. He is hopeful his OCB contributions will be recognized as part of his service requirement. For Young, his position as an instructor has evolved into a more administrative position in large part due to his technological expertise, he now hopes his assistance behaviors will pay off with continued employment. Gray has had a long career at Inland and help others primarily for personal reasons and to keep himself engaged in the institution. They have all become valuable members of their respective departments not only for their disciplinary expertise but also for their technological knowledge and abilities. While it may be easier to replace them with other faculty with similar disciplinary expertise, to find someone with their technological expertise as well may prove more difficult. Using Ahrne’s organizational model, the techno-profs can be described as affiliates who possess unique information or skills, making them more difficult to control and more difficult to substitute either on a daily basis or over the long term.

The use of technology is encouraged at both institutions, and the desire to get larger groups of faculty to adopt technology is an ongoing crusade. Both Young and Gray mentioned that there were resistant faculty in both of their departments. Gray explained that many faculty have no time to struggle with learning about computers and technology
and they tell him that they just can’t deal with it. He notes that "they give up, I don’t". A similar situation exists at Coastal where Instructor Young, must translate that administrative mandate into a reality within his department. He states:

The use of technology is encouraged - definitely. That would be true college wide. Probably to a lesser extent in our department than in the college, and university. I think our department in general is fairly resistant.

Professor Green, whose primary discipline is electronic writing voiced his frustration that his colleagues, those who will eventually evaluate his work when his time for promotion and tenure review arrives said

To be the technology person [in this department] is different from being the Shakespeare person. There’s enough out there that this is a separate area of inquiry: I’ve got shelves and shelves [of scholarly texts] that demonstrate that, but it’s a different type of position than most academic departments are used to because it does combine my research, service and teaching in ways that I don’t think other people in the English department have experienced those three areas.

So, in this case, two needs surface at the universities, connected by technology, yet in direct counterpoint to each other. The university needs to improve the quantity and quality of its technological support. As that support system evolves into what the administration hopes is a more responsive system for assisting faculty, the techno-profs continue to be a reliable, accessible source of assistance for their colleagues in a reward
system that does not truly recognize their contributions as part of the traditional view of faculty work.

In response to an economy which requires an increasingly technologically literate workforce and a public more comfortable with technology demanding to be taught about and with technology in their higher education, universities have invested heavily in a technologic infrastructure. Administrative and academic computing have become a recognizable feature of virtually all levels of collegiate life. Faculty, especially older faculty find themselves no longer able to merely teach their subjects the way the have for years. Lacking in this scenario is an efficient, training and support system to meet the needs of the faculty. Disciplinary expertise they have, technologic expertise they often lack. Preferring to learn about technology from their colleagues, mainstream faculty often bypass the traditional support structure (the help desk) and go directly to one of their peers for assistance or mentoring. This assistance while convenient, available on demand, and delivered on-site is an excellent means to have a problem addressed, it is often an overwhelming experience for the individual who has been identified as the go-to person in the department. Although it is typically not the primary responsibility of the faculty member to assist his colleagues with technological problems, these good citizens provide this assistance on a daily basis without recompense or hope of reward. They help for a variety of reasons, and the university, generally aware of what they provide, are glad they provide the assistance they do. The techno-profs provide this assistance at great risk to their own academic careers, however.

The next section provides a profile of the personality characteristics of the techno-
profs, the similarities and differences in their education and technological backgrounds, the specific types of assistance they provide, and the beneficiaries of their citizenship behaviors.

The Techno-Profs - “Syntax Savvy” Experts

In *The Accidental Trainer*, Elaine Weiss (1997) describes a group of individuals who enjoy working with technology, become the resident experts of their workplace, and enjoy sharing their knowledge with others, even though teaching others about technology is not part of their official job duties. Weiss refers to these individuals as *accidental trainers* because they typically never plan to become the resident computer trainers, they just “wake up one morning to discover that they are doing more than giving advice; they are teaching” (p. xi). Weiss’ work lacks any description of the accidental trainers, their characteristics or background, preferring to direct her treatise upon the methods they should employ to better train their “students.”

In this case study, the techno-profs find themselves in exactly the same situation; they offer advice, provide teaching and render assistance to their colleagues. To gain a better understanding of the helping behaviors of these organizational good citizens it is necessary to discern who the techno-profs are as individual faculty members.

Weiss (1997) argues the existence of a “proficiency continuum.” At one end, the *naive* user has such limited technological knowledge that she describes them as being only “system aware.” As the computer user becomes more proficient and gains a *breadth* of technological knowledge, they become “system savvy”, that is, they have a practical understanding of computers and how they work. At the next point on the continuum is
the "task-savvy" user. As one who has gained perspective, these individuals are able to translate their experience with a few systems and software programs to complete tasks they have not previously done with a computer. Given a unique problem to solve, they are able to employ the skills and knowledge they have gained previously to use the computer to complete any task at hand. At the far end of the proficiency continuum, the most experienced computer user is referred to as "syntax savvy". This degree of expertise is reached when an individual has acquired a high level of technological skill as the result of active participation and practice. The syntax-savvy computer user possesses a depth of knowledge and has generally mastered the rules necessary to operate multiple systems and applications, apply these skills to unique problems, and is able to quickly learn new technologies and systems. It is the syntax-savvy computer users who become the 'accidental trainers' in the workplace (Weiss, 1997). In a university setting, the syntax savvy-faculty member tends to become the resident expert, the techno-prof for the department.

Faculty expertise has also been studied by Finnegan and Hyle (1998). In a paper presented at the American Society of Higher Education, Finnegan and Hyle (1998) explored the associations between faculty rank and professional expertise characteristics. Using non-directive interviews they employed the concepts of hidden expert knowledge as described by Bereiter and Scardamalia (1993) to uncover three distinct, progressive patterns of expertise and knowledge discovery among junior, mid-level, and senior faculty. Their interviews revealed that the sources of faculty knowledge (Informal knowledge), the use of knowledge (Impressionistic knowledge) and the amount of control
over professional activities (Self-regulating knowledge) change as faculty mature professionally. The expertise characteristics described by Finnegan and Hyle (1998) were evident in the techno-profs interviewed for this case study. Although the faculty in this study possess similar technological expertise, they are at vastly different points in their academic career paths, and hence are at different points in the development of their professional, disciplinary expertise. A profile of the techno-prof emerges which depicts their personal characteristics (self image, backgrounds, skill acquisition) and the types and beneficiaries of assistance they offer.

Personal Characteristics

Techno-prof Self-Image.

The three techno-profs are comfortable working with technology and find computer technology a useful tool to accomplish their work. They are primarily self-taught and view technology as a challenge to be mastered. Each has a long history of using a computer at home and during his education. Each is readily identified within his respective department as the computer expert and is confident in his technological proficiency, even though he may be a relative newcomer to the institution and the academic profession.

Professor Gray, definitely not a newcomer, is readily identified by his colleagues as the resident expert. He laughs and notes, "I’ve been introduced to new faculty as the ‘computer guru’ of the department -- to new faculty and even new candidates that come on campus." Professor Gray explains his agility with technology:
Well, I feel pretty comfortable with computers and feel I can do whatever I want to do with them and if I can’t, I can find out how to do it. So, I’ve never really been threatened by them. I’ve always felt it was kind of a challenge, a puzzle to be solved and I’ve been known to work until three or four o’clock in the morning trying to get something done that I want to get done.

Both Green and Young at Coastal consider themselves fairly proficient, but are quick to point out they do not consider themselves “computer geeks” – a persona they consider pejorative. Green, describes his strong desire to work with technology:

Technology is something that is my chosen field of study and to a certain degree in the last ten years, well even before that. There’s a sense of being a computer geek, but that’s still a social thing, it’s still a social choice. I mean even if there are a number of computer people who are sort of antisocial and sort of fit that stereotype. I don’t think I fit that stereotype. I’m always conscious that I made the choice and I enjoy working with it, working with technology.

Young regards himself moderately technologically proficient.

I would say that I’m fairly technically proficient. I don’t think of myself as a real geek. I’m certainly capable of learning the technologies. I’m interested in learning about the latest technologies that are in my field but I don’t think of myself as being real cutting edge, really advanced technological person.
Young started his career at Coastal as a computer coordinator. This faculty position required him to provide a large amount of technological assistance to faculty, but also to teach courses in the department. He quickly became overwhelmed with doing both teaching and running the computer laboratory for the College. He states:

This multi-media lab in the department was created as a College lab, it was an Arts and Letters lab, and that was the way our department, historically a poor department, could get funding for machinery. So for a period of time I was running [it] for the entire college.

Since those first years at Coastal, his technological duties have shifted as the lab now employs specially trained graduate students to take care of day to day running of the laboratory. Young now teaches more, works on special projects (a series of on-line archives of university events) and receives a course release to be the computer coordinator.

I get a course release for being the computer coordinator in our department. So one of my main responsibilities is to schedule our teaching lab so I get a lot of questions about scheduling.

Despite the shift of his technological duties (which were reassigned to other personnel), he is still recognized as the computer coordinator for the department. As such, he fields a number of computer-related questions each day. Young describes the evolution of his career:

In the past, I was doing everything. Everything technology-related was my job description. So scheduling the lab, developing a web presence and
running this technology committee and helping people—all on top of teaching three classes. So I have, over time, really cut back on the hands-on help that I give and have really moved more into directing. So that redefines my position and I try to operate more as on executive level. I now have an instructorship, which is six years long. So, in two years, I’m out of a job. And so that’s a little problematic too. There’s a chance I could be promoted to a lecturer, but I don’t know if that will happen.

He is aware that another techno-prof in the department (Professor Green) provides technological assistance, but notes that he continues to provides a fair amount of help to his colleagues as well. He alludes to a third faculty member who was a techno-prof, but has ceased to provide assistance:

Well, we had another faculty member who was a techno-prof. But once you get on a tenure track, at least in our department, but it’s probably true elsewhere, service and helping you know, you don’t go there, because you’re supposed to publish.

*Mainframes and Apples in their Background.*

All three techno-profs hold terminal degrees in their respective fields. The senior techno-prof, Professor Gray, received his doctoral degree from a Research I university and Professor Green received his from Doctoral I institution. The techno-prof with an MFA obtained it at a “selective” liberal arts institution (Almanac, Chronicle of Higher Education, 1999, p. 50). All three techno-profs have worked with computers for an extensive amount of time; Green and Young have used them for more than 15 years and
for Professor Gray, it has been nearly 30 years. Both Green and Gray used mainframes as undergraduate students. Gray describes his undergraduate experience with computing:

> I was actually a physics major as well. I started out as physics and math. So the fact that I had that scientific or technological bent already, it led me into computing and technology. Of course when I was in college, when I was an undergraduate, computers weren’t anywhere near what they are now so I really didn’t have the opportunity except for mainframes. It was primarily main frames, FORTRAN, punch cards and things like that, that’s the way I started out.

Green had similar experience working with mainframe computer at his high school:

> They had some courses that I took in High School (laughs) in those horrible, those horribly outdated courses in FORTRAN and COBOL and using the punch cards.

The two younger faculty had early experience with Apple computers as high school and college students in the mid 1980's, while Gray has worked primarily with IBM/DOS or Windows based systems. Prior to coming to Coastal University, Professor Green’s

> My family bought an Apple II plus when they first came out. I bought my first MacIntosh in 1986. For a long time it was just, you know, using it for word-processing and play games. But I think having had them, being around computers for such a long time, there’s almost sort of two kinds of proficiency. There’s the proficiency of being able to take a software package, read the instruction manuals, and be able to use it. And then
there's the kind of proficiency where you can just basically start an application and use most of it. I'm sort of that second type. I can pick something up and pretty much figure out what to do with it—almost intuitively.

Likewise, Instructor Young grew up using computers in the mid 1980's and used them while he was a graduate student:

I bought my first computer in 1985 and before that I was in college and working on a main frame, so I was fairly advanced, even at that point. When I went to the University of __________ for my graduate work I discovered that the study of English, the field of English was really wrapped up in computer-assisted instruction and so immediately went in that direction. It seemed something that fit my prior experience and it seemed a real attractive direction to put my career in.

As with Green, Instructor Young was also working with Apple computers prior to his employment at Coastal University. Neither faculty relayed any major problems making the switch to the Windows-based systems prevalent on the Coastal campus. Although Young's first computer was a DOS-based system, he has worked almost exclusively with Apple systems prior to coming to Coastal:

My first machine was not a Mac, but yeah, I've worked only with Mac's really prior to coming here to [Coastal]. So, I had to learn the whole PC world once I got here. There was a learning curve and I took some training courses on DOS and things like that and it's not a problem any more.
Green relates a similar story in that he grew up using Apple systems and has found the transition to Windows-based systems fairly easy:

I first started sort of putzing with PCs about five years ago. I was definitely sort of a Mac addict, or whatever, before I came here....but it wasn’t that big of a switch. It hasn’t been that big of a problem. I mean Windows 95 and NT are—it’s a Macintosh interface basically.

Professor Gray has used Apple systems but prefers DOS/Windows-based systems because he is a “tinkerer.” “I mean I know how to use them and all [Macintosh systems] but I’ve just never really—I like to get into the guts of it more than the Mac allows you to, you know.”

Each of the techno-profs uses a computer at home, although Young does not have access to the Internet with his home computer. Green has two computers at home, but only uses one regularly. Gray uses his home computer “all the time.”

Each of the techno-profs had early experiences with Apple computers either at home or as part of their secondary school background. Both Green and Gray have mainframe computer experience from their high school and undergraduate college days, respectively. They all have computers at home and the computers they have at work are quite advanced compared to the mainstream faculty. Technology is an integral part of their lives both at school and at home.

Skill Acquisition.

The three techno-profs are primarily self-taught with regards to the use of computers and software applications. They prefer to learn new software and applications
via pull-down help windows rather than reading the enclosed manuals. Their skill acquisition is self-directed and is an activity they pursue at home and at work. Green is currently teaching himself several new software programs including a multimedia application. “I’m trying to teach myself. I’m teaching myself Visual Basic right now, and I’m teaching myself Director 6. It’s just a matter of - I set aside some time every week and I sit down and fiddle.” Weiss (1997) would say they have learned how to learn about computers (p.27).

The techno-profs are not averse to taking structured courses in computing, however, and both Gray and Green have taken classes in the past. Professor Green took a few beginning computer courses when he was in high school:

Yeah, just the very basic kind of stuff....and after that it’s just been self taught. I mean there’s enough of a....well, what I tell my students is that there’s enough of a culture out there where people are helping each other to learn how to do this stuff. You can teach yourself HTML just by getting onto the Web.

Gray notes that there were no computers around when he was an undergraduate in the 1960’s. Although he took some computer courses at Inland over the past few years in order to learn some skills in programming he notes that:

I am pretty much self-taught. I have taken two computer science courses here at the university. Introductory courses really – and it’s basically programming in Pascal. I really look at it sort of like learning a foreign language.

Techno-profs are individuals who enjoy working with computers and technology.
They have "learned to learn" about computers and have little difficulty applying their skills with computers to solve problems. They typically have an early exposure to computers and a long history of computer use at home and at work. To the techno-prof, learning about computers is a challenge and is an avocation that they enjoy thoroughly. The skills and expertise they gain through their interest in computing is immediately, and often directly, transferrable to their work.

Readily identified as the departmental expert, the techno-profs are sought out for their assistance regarding technology and technologically related problems. The questions techno-profs are asked are as diverse as the faculty who come asking them, however they generally deal with hardware/software issues, Internet and pedagogical application concerns. The type of assistance provided is determined by the expertise of the techno-prof, however they rarely turn away a colleague who comes asking for help.

Types of Assistance Provided

The techno-profs at both institutions in this case provide assistance in a number of diverse technological subjects. The questions these good citizens confront primarily arise within four broad areas: hardware issues, software issues, Internet questions, and pedagogical questions. Hardware assistance includes any desktop computer, printer, scanner or peripheral device problem. Software assistance includes installing, troubleshooting, and assisting faculty in the proper use of software applications, such as word processing, spreadsheet, statistical, presentation, or any proprietary, discipline-specific software. Assistance related to the World Wide Web or the Internet includes configuring and using web browsers, e-mail problems, file transfers, and web page
construction. Questions also arise related to the use of technology in a pedagogical setting, including the incorporation of hardware, software, the Internet, or web pages within a specific course.

The web-based survey from which the techno-profs were identified reveals several distinct patterns of assistance seeking among the faculty in the Humanities Department at Coastal University. The faculty at Coastal seek help with hardware-related problems from two different techno-profs within the department, Professor Green and Instructor Young. The most often asked questions involve World Wide Web and Internet problems. For these issues, faculty go primarily to Professor Green and then to Instructor Young as an alternative. When questions arise concerning software problems, both Green and Young are equally sought out, however Green is again the first choice for nearly all faculty with this type of problem. When questions arise concerning pedagogical uses of technology, both Green and Young are tapped for assistance, but in this case, Instructor Young is the first choice of faculty with this type of problem.

The most asymmetric pattern of assistance seeking occurs when faculty need assistance with their computer hardware. Of the four areas, hardware assistance requests comprise the least asked questions; faculty appear to prefer to go to the university computer center for assistance. For the faculty who do go to a techno-prof with hardware-related questions, they all go to Professor Green; no one indicated that they would go to Instructor Young for this kind of assistance. In the aggregate, more faculty go to Professor Green as their first choice for technological assistance than go to Instructor Young. However, Young appears to have a reputation for more expertise or
interest in pedagogical uses of technology. The social network analysis shows that Professor Green is considered by the faculty to be the primary departmental techno-prof and Instructor Young is considered to be the secondary techno-prof and is sought for his expertise in an area that Green is not.

A different network of citizenship behaviors emerges at Inland University. At Inland, the social network analysis of the Humanities department revealed a single recognizable techno-prof. Professor Gray is the faculty member of choice for the majority of faculty who responded to the web-based survey. For all four types of assistance areas, Gray was the first choice for about half of the departmental faculty. The remaining half of the faculty choose to seek help from among a plethora of other sources of assistance, such as other departmental faculty members, the computer center, secretaries, library personnel, or the recently introduced technical support liaisons. Professor Gray is the ‘go-to’ faculty member when his colleagues need assistance with hardware, software, Internet/WWW, and pedagogical issues and questions. He is their first choice approximately half of the time, their second choice when others are unavailable.

The assistance that Professor Gray provides has evolved over his long career at Inland. Starting with minor hardware issues, his trouble-shooting has transformed into more complex questions dealing with the World Wide Web and the incorporation of technology into specific courses. His technological expertise is now sought for what technology can do to help faculty teach and students learn rather than merely the more mundane issues of hardware and software assistance. Gray explains:

It used to be just very simple things like "how to hook up my printer?" and
"how do I install this software?" I guess now it's probably more "how do I develop a web page?" or well, sometimes it has to do with "how do I get the accented characters in Word Perfect?" or things like that. I think probably it may be a little bit on a higher level [nowadays]. Pedagogical kinds of questions and all that. "How can we integrate what we are doing in our class?" or "how can we integrate technology into our class?" I think probably it may be a little bit on a higher level.

Gray no longer receives questions related to hardware issues, but is asked general software application questions and higher level questions regarding the construction of web pages. This is due in part to the Departmental Liaison, who handles many of the more mundane technological questions in the department, freeing Gray to handle the more complex, pedagogical and disciplinary-related questions. It is also in part due to the development of his expertise in things technological over the years. Having worked with technology for many years in his discipline, Gray has been able to achieve a level of expertise that Weiss (1997) describes as a syntax savvy.

He understands the rules of syntax that apply across systems and software programs. When a faculty member comes to him with a problem, a dilemma, or an idea, Gray is able to draw upon his expertise to find solutions that are applicable to the issue at hand. Gray explains:

I guess they know, well they know I am technologically proficient but they also now that I have a sense of how the technology can contribute to our field or discipline. And I think there is a certain amount of respect that
goes along with the fact that I have PhD just like they do and that they feel they are probably ready to accept my advice more than those who didn’t have the same degree- didn’t have the same experience.

At Coastal, both Professor Green and Instructor Young are approached by their colleagues with questions of varying complexity. Both are asked hardware, software, and WWW/Internet questions, however only Green is solicited for his HTML and web page construction expertise. Green is asked hardware and software questions in part because of the location of his office and in part because of the cycle of updates of software and hardware within faculty offices:

People will ask me if there’s something wrong with one of the computers in the lab, partly because my office is just down the hall from it. I get a fair amount of questions because we’ve been upgrading the computers throughout the college and a lot of people have been moving from one word processor to another and I get questions about converting things and that sort of stuff.

The number of hardware questions Green is asked has been diminishing, although he does get the occasional query from faculty experiencing printer problems. He notes, laughing:

Sometimes, but not very often. And with printer [questions] very often the problems that people have can be everything from just the settings up to forcing the plug in the back of the computer upside down.

Green also notes that the majority of the questions he is asked by faculty deal with the
world wide web and web page construction. "I get a number of, a lot of questions about HTML web design, that kind of stuff, not even just web design, but the nuts and bolts of doing it. Whether it's how do you use a particular FTP [file transfer protocol] client to a particular snippet of code." Green attributes the increase in world wide web questions to an institutional push to have every course at the institution to have a web presence. His assistance is increasingly in demand as more faculty require help with basic web page construction as well as instruction on the best ways to incorporate web resources into their classes.

It's becoming more and more that it's not just a matter of one 'geek' in the department has a home page. Meaning more people are getting into having home pages. More people are doing stuff on the Internet whether it's special classes or clearinghouse sites for different resources. I think more students are using the web for research, so it's becoming more important for faculty to understand how they're going to use it and how to find out how someone [else] has established stuff on a website.

Instructor Young is also asked a number of questions ranging from the very simple to the more complex. He is asked for assistance for the operation of computer hardware, software questions (mainly word processing), and occasionally Internet and WWW questions. Young is also approached by faculty with questions regarding the purchase of computer systems for personal use. "I get hardware questions, Internet questions--attachments to e-mail for example and "what kind of machine should I buy for my house?" Everything from purchasing to operation."
The patterns of assistance the techno-profs provide include some combination of hardware, software, Internet and pedagogical questions, and vary between the techno-profs and between the institutions in which they are located. Techno-profs are more often the first choice for assistance from their colleagues, with the help desk or some other source of assistance being a less popular avenue for technologically related aid. Clearly, individuals are the primary targets of techno-prof citizenship behavior as techno-profs are approached on a daily basis by their colleagues, staff and students and are asked to provide assistance concerning some technological issue. Not all the organizational citizenship behaviors exhibited by techno-profs are directed at individuals, however, a substantial portion is directed towards the organization as a whole. The section which follows describes the two main beneficiaries of techno-prof assistance, individuals and the organization.

The Targets of Techno-prof Citizenship Behaviors.

Williams and Anderson (1991) suggest that organizational citizenship behaviors are best categorized into two broad areas: a) OCB, behaviors that benefit the organization in general and b) OCB1, behaviors that immediately benefit specific individuals and indirectly through this means contribute to the organization. The techno-profs in this case exhibit both types of OCB, but in varying proportions: the amount of assistance provided to individuals versus that directed towards the organization varies significantly. Whether the focus of the techno-profs' behavior is on the individual (i.e., the intent of the assistance is help for an individual), or if the target is not a specific person (i.e., help directed towards a group or the institution), the efforts of techno-profs...
are ultimately beneficial to the department and to the organization as a whole. Organizational citizenship behaviors, regardless of the target, are by definition, performed in addition to the myriad other tasks faculty must perform. The ability of techno-profs to decide whom to help and what type of help to provide, is influenced in large part by the extent to which they have developed the self-regulating knowledge behaviors that allow them to operate as experts.

Finnegan and Hyle (1998) explored the connections between faculty rank and the development of expertise in their field. They determined that patterns do exist that may be more related to longevity than rank, but that disciplinary control and confidence most likely develop due to multiple factors as faculty members progress through the ranks. The faculty members in this case reside at nearly both extremes of the faculty rank continuum.

Green is an assistant professor just beginning his career at Coastal, Young, in his fourth year fills a non tenure track instructors position in the same department. Gray on the other hand, is a senior faculty member, an associate professor with thirty years of service at Inland. While they may be at different points in the development of their disciplinary expertise, the expertise they possess in things technological is similar at a high level, they are syntax-savvy. The common thread between these disparate individuals is that they are all the techno-profs in their departments. Diverse and evolving patterns for the targets of their assistance are apparent in each of the three techno-profs.

**Evolving Citizenship Behaviors**

Professor Gray describes an evolution in his assistance behaviors. His efforts
years ago were directed mostly towards the organization (OCBO), but are now directed almost entirely towards individuals (OCBI).

"I would say it's now probably 90% -10% or something like that. Ninety percent the individual and 10% to the organization. Where before it was probably, if you counted the lab as being service to the organization, then it was 10%-90%.

A senior, tenured faculty member, Gray’s knowledge cuts across his disciplinary area. His informal knowledge has broadened to include the application of new methods within his specialty.

Instructor Young describes a pattern of helping behaviors that has evolved in an opposite direction. Whereas his assistance was directed towards individuals during his first three years at Coastal, it has now shifted towards behaviors which benefit the organization.

In the past, working with individuals took up 75-80% of my time. And now working with individuals takes up 30-40% of my time. A bigger majority is devoted to sort of broader concerns, the lab, developing programs with the library.

This evolution of assistance from the individual to the larger organization has occurred in part because the college has hired technical support staff to take care of many of problems that faculty encounter, they no longer need to go to Young for every problem they confront. Once Young established himself as the departmental techno-prof he soon found that the tasks of teaching, running the lab, and answering all technological questions

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became a monumental undertaking. He became overwhelmed with the work he was expected to accomplish and consciously redirected his efforts towards projects which benefit the organization rather than a specific individual.

You can't do everything, right? And you don't want to be exploited. I really took a risk a couple of years ago and just really let the dean and my chair know that I was being overworked and that I couldn't do everything. There's an opportunity every year to write a personal statement about your teaching in our college and the dean reviews the personal statement and the chair reviews the personal statement and I wrote about these issues. So, I addressed that I was doing too much, it felt like a real risk but it also felt like I had to say something, otherwise I was just going to be crushed by all of the work, I would be completely overwhelmed.

Young, realizing that he "cannot do everything", has begun to adopt self-regulating behaviors in an attempt to manage the stress of his position in the department. He is juggling the multiple demands placed upon him while at the same time learning what other work is expected of him. Since Young is in a non-tenurable position with a broad and rather vaguely defined job description, the stress upon him is considerable. He continues to provide assistance to his colleagues, however because he wishes to increase his visibility within the department and solidify his status as a valuable faculty member.

Green did not place a quantitative value upon his OCB. Now at the beginning of his academic career, Professor Green seeks a blend of assistance, and divides his efforts equally between assisting individuals and behaviors that benefit the organization. He is
clear in that his efforts are directed towards his goal of achieving tenure at Coastal.

"I feel all of it [assistance to individuals and to the organization] goes
towards the eventual sort of intermediate goal of getting tenure."

He realizes that his time is a precious resource and that he will eventually be reviewed for the quality and quantity of his teaching, research and service. His efforts, therefore, are very deliberate, his behavior more calculated. Finnegan and Hyle (1998) succinctly describe the knowledge which drives the behavior of Junior faculty members:

The self-regulating knowledge that Junior faculty must realize includes understanding how to organize and prioritize one's work and pace and to cultivate one's research style; recognizing the need to separate oneself from a graduate advisor and his/her scholarly style and methods, perceiving how to develop legitimacy and visibility in the profession, and increasing an awareness of the value of seeking and accepting criticism from others as the process of self-critique. (p. 13-14).

Green, only having been at Coastal for two years, is still learning how to prioritize his teaching, research and service activities. His connection to his graduate school days are vivid and strong, he mentions his doctoral institution often during the interview. He consciously seeks to make sure his contributions at Coastal are considered legitimate, scholarly work. He combines his efforts to assist individuals and his efforts to help the organization so that the objective of achieving tenure might ultimately be met. He relates an example of an instance where assistance provided to an individual gives him data and experiences he incorporates into his scholarly work.
In the process of helping people do web sites and coming up with usable analogies, helping people make sense of the web that doesn't seem frightening to them for what they're doing, all of this has informed the way I think about my scholarship.

Green considers his technological expertise to be greatest in the area of the World Wide Web and the Internet. He enjoys working with web page construction and, although not part of his assigned duties, he revised the departmental web site and has created web sites for professional organizations. These activities are, he reasons, a large part of his service role. He incorporates his service activities into his teaching duties by assigning the students in his web design course various projects which include the provision of assistance to organizations in the design, construction, and implementation of a web presence. His research activities include the conceptualization, design, and construction of large-scale web sites, so his service, teaching and research activities also become intimately intertwined. Green explains:

Yes, my research, teaching, and service all sort of bleed together in ways that I don't think they do for other people in my department. One of the things that I do, entirely on a volunteer basis is I coordinate the web site for the ___________, which is our big conference each year and part of doing that is thinking about what kinds of resources are going to be useful to other people in the profession, but designing those large scale web sites is also something I'm interested in terms of research -- what kind of decisions have to be made -- how it can be implemented -- so when I'm
teaching this stuff in classes, for most everything I do, each activity has an impact on the other area.

Clearly, Green is cognizant of the demands placed upon him as a newly hired, tenure track faculty member. He makes a conscious effort to expend his energies into projects that will demonstrate activity or produce results in all three of the required areas for tenure. As a new faculty member he is in the process of determining who his role as a professor and as Finnegan and Hyle (1998) note:

One aspect of self-regulating knowledge requires new faculty to gather information that enables them to determine how to enact their new role set, to determine the institutional weight ascribed to the various professorial tasks, and to determine how to schedule their time and energy to meet those demands.

Instructor Young provides on a daily basis assistance that “I’d say 100% benefits the department. Whether I’m helping individuals, they’re typically in the department. It’s all good for the department.”

Organizational Citizenship Behaviors Directed Towards the Individual.

The beneficiaries of organizational citizenship behaviors are at the most basic level, specific individuals, and in the aggregate, the organization. Organizational citizenship behaviors are generally directed at particular individuals within an institution. In this case, it is primarily other faculty who approach the techno-prof with requests for assistance. The techno-profs do provide assistance to other members of the university community as well. The three techno-profs provide assistance primarily to other faculty,
but also to students, and to a lesser extent, staff.

Professor Green provides individual assistance in short sessions which help a single person at a time, usually when they drop into his office. "The things I help with are like 10 minute sort of 'one little thing' type deals, just where someone has gotten stuck." Green's assistance is directed towards all members of the department. The help he provides is "split between faculty and students, with a little bit of staff," but he is approached by and assists mainly faculty members within his department. Only rarely does he provide assistance to the chair of the department or dean of the college.

Instructor Young provides assistance to anyone who asks, faculty, friends, students and other departmental staff members. "If a friend comes to me and needs help, whether they are my colleague or not, I will help them. And if departmental [people] come to me and ask me to do something I will weigh the request in proportion to the other demands the department is making on me." Young also points that there are instances in which he does withhold assistance:

I withhold assistance to protect my time to define the boundaries around my schedule, particularly I withhold assistance from people outside the department.

Young's withholding of assistance clearly demonstrates self-regulating behavior as described by Finnegan and Hyle (1998). Although he is eager to please his superiors, make a name for himself among his colleagues and solidify his position within the department, he realizes he cannot do everything he asked to do. He has learned to choose which requests to accept (those from within the immediate department) and which
requests to reject (those from outside the department), all within the context of his own survival within the organization.

Gray and Green likewise exhibit self-regulating behaviors to control their time and energies, but each does so for different reasons. Neither Gray or Green withhold assistance from those asking for help. Green is at an even earlier stage of his career than Young, and he, too, is eager to establish himself as a vital, contributing member of the department. Rather than discriminating between those individuals to help and those not to help, he has adopted the tack of providing assistance to all who come to him. Gray, in fact, does exhibit self-regulating behavior, noting that he prioritizes who he helps and when he provides such help and thereby protects his time:

I've been a little slow or some have higher priorities than others I'd say but I've never actually not done what people ask. I guess it's just mainly what I have time for and the people I feel closest to, the people I've worked with all along.

Green, unlike Young and Gray, does not withhold assistance from anyone, but prefers to direct those individuals he cannot help to another source of assistance:

There are times if it's something that I know someone else can handle, then I'll make an effort to try and hook up the person with that other person. I'm bringing people together and getting something done, assistance is still occurring so I may transfer that assistance – I may not be directly involved with it but I would provide it myself if I could.

The most obvious beneficiaries of techno-prof citizenship behaviors are the individual
faculty who come to them for assistance, advice and mentoring. In addition to providing personalized, one-on-one assistance, techno-profs also contribute to the overall effectiveness of the organization by exhibiting citizenship behavior that is not directed towards a specific individual, but benefit the organization as a whole.

Organizational Citizenship Behaviors directed towards the Organization.

Organizational citizenship behaviors directed towards the organization, or OCBO, have been labeled “generalized compliance” (Organ & Konovsky, 1989; Smith, Organ & Near, 1983). This label is restrictive and has been used in the past to refer to acts that are performed in the expectation of rewards or the avoidance of punishment. Drawing on the work of Williams and Anderson (1991), Organ (1997) recently broadened the definition of OCBO to include; “a dimension of organizational citizenship behavior which offers no immediate aid to any specific person or persons, but demonstrates and sustains high standards for attendance, punctuality, conservation of organizational resources and use of time while at work” (p. 95). Key to the concept of OCBO is that the organization or unit is the target of the good citizens’ behavior, not a specific individual. In this case, much of the OCB exhibited by the techno-profs is OCBI in nature, but each provide some measure of OCBO.

The organization benefits from the citizenship behaviors of the affiliate techno-profs through the conservation of organizational resources. Fewer support staff are needed and the existing support system is less utilized due to the efforts of the departmental techno-profs. Techno-profs often act as the first line of help for computer troubleshooting at the end-user level, resulting in a concomitant reduction in the number
of calls to the help desk, thereby reducing the number of help desk personnel needed.

Because techno-profs provide a substantial amount of teaching and training assistance, it reduces the need for institutional training staff as well as reducing the number of faculty sent to training sessions either on or off-campus. Computer training sessions are often viewed as expensive, time consuming, essentially non-useful experiences, where little is actually learned.

Organizational resources are conserved because techno-profs get things done - they install hardware, load software, troubleshoot problems, develop web pages, teach their colleagues how to use technology, and get placed on numerous technology-related committees. Because they do all of these things, the organization need not expend its resources to achieve an effective level of diffusion of technology across campus.

Professor Gray provides assistance that is directed towards the department or organization as a whole beyond that which he provides towards individuals. Although it is not part of his job duties, Gray now acts as the departmental web-designer, and he often finds himself in situations fraught with disagreements between members of the department.

The other thing I've been taking on now for the department is being "web master" for the department and that has some political ramifications because if there's some controversy and people want something presented in one way and others want it another way and all that, then you are in the middle of it. They say - "Here, put this up on the web even though it's not fully approved" and I say "I'm sorry I can't do that yet. You know it has
to be officially approved." I want to stay out of the politics as much as possible.

Finnegan and Hyle (1998) note that senior level faculty "are in control of their professional life, they can accept or refuse new projects" (p.9). Gray accepts the challenge of being the webmaster because he has the expertise and the interest to tackle such a project. He is *neither* interested nor afraid of the accompanying political aspects, infighting and controversial issues which arise with such a project. He *is* interested in the technological aspects of creating and maintaining the department web site and does so voluntarily. The department benefits since no extra resources in equipment, funds or personnel were expended to perform this function.

Professor Gray has also recently developed a course in computer applications that allows departmental students to meet the university computer proficiency requirement. Since the course is part of his assigned teaching duties, the assistance he provides related to that course is technically not considered organizational citizenship behavior. His offering this course benefits the entire department, college, and university. Describing the individuals he helps the most, he responds:

Faculty, but then also students now because I am teaching this course on the application of technology and modern languages and that is a course the students have to take in order to fulfill a computing proficiency requirement. At Inland, every concentration has to have a means of fulfilling a requirement that they have for proficiency in computer and all. I designed a one hour credit course for all of our majors and every
semester now, I am teaching this course to about 25 students or so and it turns out that they also tell their friends and they say "hey if you want to find out how to put your web page together," they take my course.

Green describes the assistance he provides to the individuals in the department as “ten minute”, one-on-one types of helping, whereas the assistance he provides to the organization is more broadly defined:

I tend to think of the work that I do for the department or college as a whole being much more generalized. Like for instance, the work I'm doing on the department web site - it's kind of an ongoing project. It's not a series of discrete tasks that I can kind of pick up every once in a while and think “what else do I need to do”... or “I need to do this” and I’ll spend a few hours doing that and then I put it down and pick it up a couple of weeks later.

Because all three techno-profs are recognized for their expertise with technology they are often asked to serve, or volunteer to serve on technologically-related committees. Such efforts clearly benefit the organization as the talents of the techno-profs beyond their disciplinary expertise is exploited.

Tapped for their Talent.

The techno-profs are regularly and purposively chosen to be on technologically-related committees because of their expertise. They often chair such committees despite being junior faculty members. Choosing techno-profs to serve on virtually all technologically-oriented committees is beneficial to the department in that the most
knowledgeable individual is sent to represent the views and concerns of the unit. When decisions affecting the purchase, distribution, or use of technology are made, the department benefits by having a technologically proficient grounded in the culture and disciplinary content of the group. They are chosen because they have both technological expertise and disciplinary expertise.

The faculty member being chosen also benefits from serving on such committees since such effort counts towards the service requirement for promotion and tenure. Secondary benefits include, enhanced status in the department and in the eyes of the administration, access to the latest information regarding technology, and a voice in major decisions affecting technology at the institution. Being chosen for an inordinate number of technologically-oriented committees also has drawbacks. A primary disadvantage for the techno-prof is that the same faculty tend to get placed on excessive numbers of these technologically oriented committees. The number of committees can become too great and the work overwhelming at a time when teaching and research should be of paramount concern. The disadvantage to the institution is that by having the same faculty from each college on every technology committee tends to limit the discourse concerning technology to a small segment of the entire faculty. The biases, inclinations and limitations in expertise surface at each committee since the same group of faculty comprise the committee rosters. A second disadvantage to the institution is that the mainstream faculty, by not being chosen for service on technology committees, have less voice in decisions regarding technology, decisions which often have campus wide ramifications. The campus is denied the input of a large and important segment of the
The dean at Coastal is aware that techno-profs tend to get put on a number of technologically-oriented committees and is attempting to spread out the work to more than just a handful to other faculty, and not just the techno-profs, although she notes they tend to be asked to represent the College over and over again:

Absolutely, they are tapped. I mean, if we have a committee that relates to technology, the same faculty get asked. And that's the problem. Poor (laughs). Unfortunately there are more and more of them [technology committees] and we kept coming back to the same people, those who can articulate our case, not just those who use technology, but those who can articulate the knowledge. But it is something we keep in mind and we try to vary some of the players.

Professor Green is chair of the departmental Technology Committee and sits on several other committees related to technology, including the College Technology Committee and an *ad hoc* committee at the University level on web-based instruction.

Instructor Young has also served on several committees during his time at Coastal. He has served on so many committees over the past years that he has difficulty remembering all of their names, but he is most proud of chairing the departmental Technology Committee:

It was actually an *ad hoc* committee when I first started here and the person who hired me, I think, initiated that committee as a way to bring faculty together who are interested in technology and to also try and
discover ways to use the multi-media lab, which we brought to our
department. Multi-media meaning Internet accessible, video capturing
capabilities, graphic manipulation, and so forth. That committee became a
full committee of the department when I was chair. Other committees I’ve
been on, the Web Steering Committee. I mean I got so many committees –
I was on a committee called Instructional Lab Committee, I think.

Professor Gray is currently on the Instructional Technology Advisory Committee and has
chaired a university-wide Y2K subcommittee. After his nearly 30 year career at Inland, he
now finds that he is often not placed on many new technology committees, but is asked
who he would recommend from within the department. A change that appears to be
partially in deference to his past service and partially to avoid his continued participation.
He reasons:

Sometimes they ask me for advice on who else should be on it because
they either think I’ve been on every one or something like that and they
think we need someone else, or since I have been critical of things of how
the colleges handle technology in some instances, they’d rather have
someone else.

The deans at both institutions are cognizant that techno-profs are perhaps overburdened
by being put on an inordinate number of technologically-related committees, but they
continue to place them there because they need representatives who are knowledgeable
about the topic. The dean at Coastal, when asked if techno-profs are purposefully placed
on technological committees in a manner similar to minority or women faculty who get

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likewise placed on affirmative action/equal opportunity committees, said:

Yes. And that's the problem. Unfortunately there are more and more of them [technology committees]. And a lot of women of my generation got involved in administration and major committee assignments because we were identified as women—they needed a woman on the committee. And that's what happened to minorities and they do get exhausted, and when I look back on my service profile, it's enough to make you die of a heart attack. I try to tell all my junior faculty, male and female, minority and non-minority, you have to be able to say “no.” We will ask you sometimes, but you have to be able to say no to us and we won't take it personally and we won't be mad. And so, if the person is being the “tech guru” in the department, well then, department chair, “don't put him on the instruction committee, curriculum committee and 90 other [committees]”.

But what the dean at Coastal does want is for the faculty member who is the “guru” to be placed on the technology committees, primarily for their expertise. Problematic in this policy is that it limits the breadth of the techno-profs involvement across campus and makes their involvement in technological committees deeper.

Summary - Who Are the Techno-profs, and What do they do?

The organizational citizenship behaviors exhibited by the techno-profs often benefit the organization as a whole and not just a specific individual. In this case, organizational resources are conserved as the techno-profs create departmental and
organizational web sites and develop courses designed to assist all students gain computer proficiency. The organization further benefits as techno-profs are tapped for servitude on various technologically-related committees, even to the extent that the same group of faculty tend to get overused for such service.

These three techno-profs have worked with or around technology for many years. They enjoy learning new things and approach computer technology as a challenge to be mastered. They are tinkerers and puzzle solvers. They are, as Professor Green puts it -- "decent guys" who like to help others and do a fairly good job of it, and they prefer hands-on, one-on-one teaching. They typically have a strong personal network of computer professionals whom they contact when they have a computer problem. They also realize that they, themselves, are the source of assistance for many of their mainstream colleagues. They stay up late working on the computer, come in to the department early primarily so they can help faculty who might come by for assistance. They are system, task, and syntax-sawy computer users who share their knowledge and expertise with their colleagues on a daily basis. They are eagerly sought after for their expertise even though the assistance they provide is not part of their official job duties. The questions posed to them cover the gamut of technological issues from hardware to software and the Internet. Even more complex questions arise on the incorporation of these three entities within the academic setting, in other words the techno-profs are asked: "How do I employ all of this new technology into my classes, my teaching, my research?"

The techno-profs may not have an official title of "computer guru" but their existence is widely known and they are easily identified in their departments. They provide assistance
primarily at the individual level, directing their energies toward individual faculty
members who approach them with a question. They also provide assistance that benefits
the department or organization as a whole.

The motives for assisting other faculty varies. The younger faculty hope that these
activities will help them to retain their job and perhaps improve their chances of
achieving tenure. The assistance they provide enhances their status in the department and
makes them valuable to the organization.

Techno-profs are a valuable resource to the organization and are often placed on
numerous technologically oriented committees, often to the exclusion of other faculty.
The organization benefits in a twofold manner, first through the OCB they exhibit, and a
second time, through their committee work as part of their "official" service to the
institution.

For all of the good that techno-profs do, it is not without cost to them and their
careers. The final chapter in this case includes a discussion of the career effects on the
affiliate faculty members who take on the role of techno-prof.
CHAPTER 5
DISCUSSION
The Good Soldier - at What Cost?

As institutions of higher education seek to meet the demands of a changing technological environment they are compelled to push for increased faculty use of technology in their instructional and scholarly pursuits. As more and more faculty adopt technological innovations, universities find themselves unable to provide the necessary technological support required. Filling the support gap are the techno-profs, faculty members who are technologically proficient, have a network of technological resources, reside at the department level, and are willing to assist most everyone who asks for help. Once identified as the departmental "guru", techno-profs provide a selection of just-in-time and one-on-one interventions for their colleagues. This assistance ranges from basic requests for hardware repair and setup to complex pedagogical solutions for incorporating technology into the classroom. Their voluntary citizenship behaviors often become a time-consuming diversion, a practice of engaging in non-required activities that divert them from the crucial faculty tasks of teaching and research. While the citizenship behaviors in turn often provide the techno-profs with both intrinsic and short-term extrinsic rewards, their actions have long term consequences. They fulfill the needs of the organization, but the effects on their careers can be costly.
Organizational Effects of Techno-prof OCB on the Organization

Techno-prof affiliates provide innumerable instances of often mundane, yet nonetheless invaluable, assistance for their colleagues because they are good citizens. The major aims of this research were to identify the techno-profs, describe what the techno-profs offer, and explore the effects that being the techno-prof has upon the faculty member's career. The effects of OCB provide a means by which to understand the "what" in an social organizational context.

Techno-prof behavior has both beneficial and detrimental effects on the university as a social organization. Using the composite framework of the university as a social organization (Ahrne, 1994; Shirley, et al, 1976), the benefits and detriments in each of the four elements that comprise the structure of the institution become apparent. It is within Shirley's (1976) behavioral dimension that the interactions between Ahrne's (1994) affiliates occur. The interactional effects of affiliate techno-prof behavior on organizations, both beneficial (1) and detrimental (1), appear in Figure 4.

Affiliates Effects - Beneficial

The organization benefits from increased faculty interaction due to techno-prof behavior. Faculty within departments become identified as the "go to" person for things technological and interactions increase both within and between departments as in cases where the techno-prof is sought out by members of the organization outside their home department. In organizations where collegiality and peer mentoring are valued, techno-prof behavior facilitates such interaction. Faculty favor asking another faculty member questions about technology because they:
Figure 4. Interactional Effects of Techno-prof Behavior on Organizations

A. Prefer to ask someone who understands the discipline or subject.

Techno-profs, being faculty members themselves, would have command of the subject (or a related discipline) making the provision of assistance easier when a problem arises concerning a technological application. Help desk personnel are typically computer experts, not content experts.

B. Prefer to ask someone who has a similar background and educational level as they do.

Techno-profs tend to be the opinion leaders with regards to technology. They are sought out precisely because they are homophilous in educational attainment, status and personality with other faculty. Professor Gray related this faculty preference for his help
with technology to certain professorial psychological needs.

It’s just that they are more willing to come to me and ask the questions than the others are and I think less fearful of looking foolish. I think it’s a personality kind of thing, you know, we all have egos of course.

Even the IT Administrator at Inland recognizes the faculty-to-faculty assistance has a psychological base. "...because I think that there’s a natural distrust of the administrators, so you use those folks who other faculty trust, which is their peers."

C. Prefer on-demand assistance; generally dislike waiting for a response.

The IT Administrator at Inland said it succinctly; the key to technology is that "It’s there when I need it, and that’s true of training, too". Faculty are often under time constraints and the provision of on-demand assistance is rarely possible from the institution. The dean at Inland said;

And I think the other piece of it is- that faculty, most faculty, by their nature, are goal-oriented over-achievers. They are the true, on-time, on-demand sorts of people. When they want to know how to do something, they want it [then and there].

Since techno-profs typically reside within a few steps of many of their colleagues and because they often have an open door policy, a faculty member in need of help is generally provided assistance immediately upon asking.

D. Enjoy the convenience of asking someone in close proximity, or inside the department.

Rather than having to call an impersonal help desk or to place a work order that
may take days for a response, the ease of walking down the hall to ask a friend or
colleague a question increases the likelihood that the techno-prof will be the first line of
support within the department. Professor Green, whose office is directly down the hall
from the English department computer lab, receives a number of hardware as well as
software questions in large part due to his location.

E. Are spared having to look as though they do not understand something in front of staff.

By going to a colleague, a faculty member is not exposing his/her ignorance in
any kind of way to the general university community. Faculty are accustomed to being
the ‘experts’ on campus. To admit that they do not understand something is viewed by
some as a negative characteristic, making it difficult to for some to ask for help with a
technological problem. For any one of these reasons, techno-profs are called upon to fill
the gaps not being served by the technology training and problem solving system that
exists on campus. Mainstream faculty member will often bypass the ‘help desk’ or other
support system when he or she requires technological assistance. Rather they prefer to ask
a colleague, especially a colleague who has been identified as the techno-prof in the
department.

Resource Effects - Beneficial

Since techno-profs are providing technological assistance to their colleagues, a
concomitant reduction in the amount of services sought from the existing support
structure of the organization is possible. Techno-profs provide assistance not only with
hardware, software, the Internet and World Wide Web, but also with the incorporation of
all three into the curriculum. Fewer calls to the help desk translates to less personnel
needed to cover help desk functions. Mainstream faculty, by obtaining their information and advice from their technologically-proficient colleagues, also need not take time away from their own pursuits to attend structured computer courses, thus reducing the amount spent by departments sending faculty to such training. When asked if he offered help or training to faculty from outside his own department, Instructor Young responds:

This multimedia lab in the [Humanities] Department was created as a College lab, and that was the way the [Humanities] Department, historically a poor department, could get funding for machinery. So we had the lab which belonged to the College, and for a period of time I was running programs, training programs for the entire college. It was an opportunity for me to establish myself as the techno-prof.

Resource Effects- Detrimental

Having faculty assist other faculty can have detrimental effects as well. Technology changes so rapidly that the advice that techno-profs offer actually may be obsolete or incorrect. They may not have the level of expertise required to dispense the assistance they provide. The IT administrator at Inland when asked if he preferred that techno-profs provide more or less helping behaviors, he responds:

Well, I can remember one faculty member who knew everything there was to know, who almost destroyed a department by leading them down the wrong path. Having them do, I forget some of the software, you know, it's all gone now anyway. They were all embracing this stuff and it was just not the future. Yet, he was the self-ordained and the anointed expert
of the department, and that's terrifying and costly because you put all your money- limited resources into something that may not be supported, is out-of-date.

Similarly the dean at Inland relates an instance in which a faculty member's influence was valued as he administered the departmental network server. His desire to help out, however, exceeded his abilities, and friction arose between the department.

The [discipline] department had their own server, and the server was maxed out, it was constantly maxed out. They brought in a really great guy, he was just a techno whiz [to help run the server]. Well, it turned out that the [discipline] department hadn't upgraded their server software in about three years. They said to me "we need a new server for $20,000."

So, I had first said, "I'll do that for you." Then, I sent [an assistant] over, and he said "the server only needs a software upgrade for $375." Then I had a battle royal with [discipline] department, because I had promised them $20,000 for a new server, and of course, we got into very much the kind of macho "we-want-a-new-server" 'cause everybody else has got one. And, we were saying, "You don't NEED a new server." "But, you said we could HAVE one!" "You promised me $20,000." But, I said "Is your server working fine?" "Yeah, but... we still want the twenty thousand dollars...."

Control Effects- Beneficial

Techno-profs assist in the diffusion of technology across their campus. Rogers
(1995) describes diffusion as the process by which an innovation is communicated through certain channels over time among members of a social system. In this case the *channels of techno-profs* through their *OCB* facilitate the communication and diffusion of technology to mainstream faculty within the *university*. Opinion leaders are individuals who are able to influence other members' attitudes and behaviors. Rogers (1995) notes:

> Opinion leadership is earned and maintained by the individual's technical competence, social accessibility, and conformity to the system's norms. This informal leadership is not a function of the individual's formal position or status in the system. (p. 27)

As opinion leaders, techno-profs, while similar in education and status to their mainstream colleagues, have the technological competence and reputation to be thrust into a position of prominence and credibility with other affiliates. If this influence extends to the point where other affiliates make decisions concerning innovation in the direction that the organization deems desirable, then the opinion leader is also a change agent.

The current growth in instructional technology in higher education translates into many thousands of mainstream faculty members using technology for educational and scholarly purposes. In his most recent *Campus Computing Survey*, Green (1999), he reports that over the last six years (1994-1999) the introduction and use of technology (e-mail, Internet, class web pages, presentations, and CD-ROM) has increased in all areas and across all campus types. In the departments studied on these two campuses the mainstream faculty turn to the techno-profs for opinions, guidance and assistance with
technology. In a higher education organization committed to the diffusion of technology across the institution the organization benefits when techno-profs provide such services.

Substitutability - Benefits

The organization benefits when the techno-profs, although hired for their disciplinary expertise, also bring technological proficiency. Techno-profs are tapped for service on numerous technological committees, are asked for advice by faculty and administrators concerning the use of technology for instructional purposes, and are often the recipients of technology grants designed to bring innovation into the curriculum. Techno-profs are faculty first and foremost, but exceed their disciplinary and collegial role by providing nonrequired assistance to their colleagues in technological matters. While Ahrne (1994) notes that no affiliate may be indispensable, he recognizes that:

Organizations do become more dependent on affiliates with unique skills and capabilities. Generally it holds that the harder it is to find substitutes the more autonomy that person has. (p.42)

The skills about which Ahrne speaks are required job skills, expertise that is understood, officially valued, and nurtured by the organization. Techno-prof skills and expertise, on the other hand, falls outside their prescribed roles. Their behaviors, while officially unrecognized, are nonetheless evident to the mainstream faculty and to the academic administration since techno-profs and their expertise are well known and respected. This concept of affiliate substitutability is made more complex since the individual now possesses both disciplinary (prescribed role) expertise and extra-role (technological OCB) expertise about which the organization is unofficially aware, but does not reward. The
techno-profs are at best undervalued, and at worst of unknown value to the organization. They are less substitutable in contradiction to Ahrne's (1994) notion that positions must transcend the individual. While a faculty position might be quickly filled from among a number of applicants holding the appropriate disciplinary qualifications, it does not follow that the organization can find an affiliate who possesses both similar credentials and technological skills as well. Assuming that they are fulfilling both their prescribed role and providing extra-role citizenship behaviors, techno-profs are less substitutable than regular faculty.

Substitutability - Detriments

The organization, while on one hand reaping the benefits of techno-prof behaviors, may lose the potential productivity of these good citizens in the area of scholarly activity. By allowing organizational citizenship behaviors, the organization places its most valuable resource in a risky situation since the faculty are diverted from their regular roles and responsibilities. Skarlicki and Lathams (1995) studied the publications and teaching ratings of 71 business and psychology faculty. They found that OCB directed towards individuals (OCBI) was positively correlated with numbers of publications, whereas OCBO, behaviors directed at the organization, are detrimental to faculty research productivity and therefore to the organization's overall effectiveness.

Organizations consist of a set of collective resources that is produced maintained and used by the organization’s affiliates (Ahrne, 1994). To make the organization stronger and more efficient, they would want to secure a supply of assets that are costly to replace, such as people with special skills or ideas. Williamson (1985) refers to the...
existence of people who are difficult to replace as human asset specificity. Ahme (1994) notes that "to be dependent on something that is difficult to replace increases the dependence on the organization" (p. 15), it creates a feeling of uncertainty within the organization and causes the affiliates to direct their energies towards the protection, production, and maintenance of the asset they seek to preserve.

OCB interacts both positively (benefits) and negatively (detriments) within Ahme's (1994) concept of Organizational Resources, and Substitutability. The organizational consequences of techno-prof OCB is a positive one regarding Affiliation and Control. Other affiliates appreciate, count on and value techno-profs and their behaviors. The university gains by having techno-profs taking care of the technological needs of the departments and help diffuse technology.

The organizational consequences of Resources and Substitutability is both positive and negative. The organization benefits from the reduced demands on the existing support structure due to a cadre of valuable faculty members whose technological expertise is a boon to the institution. The net effects of organizational citizenship behaviors upon the organization appears to be positive.

Individual Effects of OCB upon the Techno-prof

Skarlicki and Latham (1995) note "that certain types of OCB may contribute to, while others may detract from an individual's performance" (p.180). Faculty who exhibit OCB experience both short term, daily effects as well as long term, career effects. The net effects of providing OCB lean towards the negative. Figure 5 depicts the individual
effects of OCB on the techno-prof within the framework of the university as a social organization.

Figure 5. Individual Effects on the Techno-prof due to OCB

Affiliate Effects - Beneficial

Techno-profs gain status within their department as the computer gurus. Across their institution, status arises from their technological expertise. For the techno-prof who is confident in his role as a faculty member, the identity and interaction afforded by status as the techno-prof can be invigorating. Rather than being overwhelmed with his duties as a faculty member and as the departmental techno-prof, Prof. Green reports being vitalized.
by his academic pursuits. He seeks ways to interconnect his scholarly activities with the technological issues his OCB raises. He views each technological question and problem brought to him as an opportunity not only to help someone, but also as a chance to learn something new about the technology or software and to connect the greater problem to his scholarly work. Green actively seeks to incorporate whatever he does technologically into his work as a faculty member. He attempts to connect his helping behaviors into his teaching, research and service. For example, he has enlisted the aid of the students in his class to help solve a web-site problem with which he was confronted by another faculty member. He is simultaneously attempting to engage his students with his colleagues’ needs all the while analyzing the processes of developing and implementing web pages as a line of research.

Professor Gray enjoys helping others and finds providing his citizenship behaviors "exciting". He is stimulated to ponder pedagogical innovation and is actively working on web based projects to create interactive applications for teaching and learning in his discipline.

Affiliate Effects - Detrimental

Techno-profs run the risk of being viewed narrowly within the department. Their disciplinary expertise may be forgotten as they become identified primarily as the computer guru for the department. Professor Green is concerned that he may be viewed too narrowly within his department. As a new faculty member he is conscious that he must establish disciplinary expertise, but at the same time he does not want his citizenship behaviors misconstrued:
I have to go through a PhD program just like everyone else. I have serious content level, I'm actually a scholar also, I don't want to be a technological janitor for the department. I don't feel like I was hired to be that here, but at the same time, there's not such a gigantic clear separation between being a researcher and being somebody who does service.

Instructor Young was so closely identified as the techno-prof early that he virtually lost disciplinary visibility early in his career at Coastal. He notes:

There was a time when, you know, I could be the college guru. I don't think they really knew I was also teaching. They sort of expected that I would be there to answer their questions and to help them.

Instructor Young has had a sense of alienation during his career path at Coastal. In the fourth year of a six-year term, he is concerned that he will not be rehired to another lectureship. He hopes that he can convert his technological expertise into an administrative position within the college.

I was hired to be a teacher. To teach Writing and Literature at the general education level. And to introduce technology into the curriculum. I was hired for that purpose. There was an understanding that I would move into this quasi-administrative role as computer coordinator, which happened right away. That got me a course release and I've been interested in an administrative responsibility so have a sense that it's through technology administration that I would have some kind of future in the university. So. I'm desperate to find another job here to continue my employment.
Since Young was appointed at an Instructor level, the assistance he provides is strained by the way he is perceived by the other faculty in the department. He is valued for his technological expertise as well as his teaching abilities. But by neither possessing a doctorate nor being in a tenure-track position, he feels that his status is viewed as somewhat lower by other faculty. Although he is readily identified as one of the techno-profs in the department, he speaks of his alienation within the department.

I would say the older faculty tend not to ask me at all. And, that my interactions with the younger ones, I don’t really have status, I’m not part of the club, really. I sort of operate in an odd orbit. I’m sort of part of it, and also expendable in a way.

Young’s non-tenure track position in the institution places him in a most tenuous position, he realizes that he is easily substitutable within his discipline, all the while his contributions as the techno-prof are not always part of his role and responsibilities. As an organizational affiliate he is in a most precarious position, and fears that he will be replaced.

**Resource Effects - Beneficial**

Techno-profs benefit from their status by receiving the latest computer technology. They are often at the top of the acquire-and-retire technology replacement chain that exists in academic departments. Generally, the most technologically-proficient faculty member gets the newest piece of computer technology and hands down his current equipment to someone with a lesser quality, or older equipment. Likewise,
techno-profs often receive the latest versions of software from the computing center so that they can test the application, discover programming bugs, and generally become familiar with the program before it is disseminated to the mainstream faculty. Access to advanced training is also available to techno-profs because as experts they have already achieved task-savvy level of knowledge and skills. They are skilled practitioners and their primary learning challenge is to figure out what they need to learn next (Weiss, 1997).

Resource Effects - Detrimental

The helping behaviors that techno-profs provide takes a portion of their time, which is one of the most valuable commodities a faculty person has. Techno-profs enjoy working with technology and gain various intrinsic rewards by helping others, but the time spent helping others is time lost from other productive work. While each individual helping event may only take ten or fifteen minutes, if the techno-prof is in great demand, multiple events can result in a large drain on that particular faculty member's time. Instructor Young feels that the amount of assistance he is providing, coupled with his regular duties as an instructor, are becoming "overwhelming."

Whenever techno-profs are helping their colleagues with technological problems, they are not performing rewarded duties, projects, and responsibilities. Techno-profs often postpone important faculty work to off-time, and off-campus locations in order to focus their efforts without interruption.

Control Effects - Detrimental

Existing promotion and reward structure neither recognize nor reward service
behaviors as much as traditional research and teaching, if at all. Faculty service, while a consideration in promotion and tenure decisions, is generally "underrated and given token recognition by most colleges" (Boyer, 1990). Service, according to Boyer's definition, is the traditional type of effort to assist or operate various levels of the organization, discipline, and community. The service that techno-profs provide is often overlooked or unrecognized. In his most recent *Campus Computing Survey*, Green (1999) states that only 13.4 percent of colleges and universities have formal institutional programs to recognize and reward the use of technology as part of the faculty review process. Even these programs do not recognize the faculty who are assisting their colleagues in using this technology. Green (1999) states:

Campuses continue to send mixed messages to faculty about their professional engagement with information technology. Recognition and reward remain essential yet widely ignored components of faculty development programs: faculty who invest in technology may be at risk when departments review faculty portfolios. (p.3)

The efforts of techno-profs do not match the types of efforts that are expected of them within existing promotion and tenure systems.

Of the three techno-profs interviewed, only Professor Gray has had a long term career. It spans thirty years. His efforts as the techno-prof have generally been rewarding in terms of personal satisfaction for him and what he terms "a certain amount of prestige" among his colleagues. He feels that the administration have not considered his helping behaviors as part of his faculty role. He has helped other faculty for the greater part of his
thirty-year tenure at Inland without any formal recognition by administrators. "They are happy for me to do it, but it really hasn’t translated into a huge salary increase or promotions or anything like that." His being the techno-prof had no bearing upon his promotion and tenure since they occurred so long ago. Being the techno-prof has negatively affected Gray’s quest for promotion in rank to professor however.

Well as far as promotion, I think [being the techno-prof] was probably a disadvantage in that it wasn’t traditional scholarship and so I have applied for promotion and have not been accepted, you know, to full professor. And it was basically [that] I hadn’t been doing as much traditional scholarship as I should have.

He expressed concern that his peers, those who hold the power to confer promotion and tenure, just did not understand the importance of technological work in the past. It was his choice however to work in a technological areas rather than to focus his efforts upon accepted activities for promotion. He feels that he has not been promoted because other faculty hold onto the traditional view of what scholarship should be.

They didn’t realize, you know, what [technology’s] importance could be or how important it could be to our discipline and all. And you know, they are more or less stuck on published works, printed works, and things like that. If I had spent the same amount of time that I spent on computers in writing a book and publishing a book, I would have definitely been full professor now.

This disparity is not a new phenomena. The Dean at Inland described the techno-
profs of the late 1980's, who were diverted from their careers to become unpaid, untitled, departmental "systems administrators" during these early days of university networks. This group of faculty he noticed, learned how to use computers, became comfortable with their use, and helped their colleagues use them, too. He lamented:

It became this incredible diversion, and it was a diversion that had no built-in faculty reward to it. There was no perception within the merit structure, within a promotion, within a tenure structure, to say you know, this is also faculty work. I think that there is probably a group of faculty out there, who were seriously injured by that. I think that is probably a bit of ancient history now.

But in reality, it is not ancient history. While it is true that universities now employ staff to act as systems administrators, someone in each department is closely identified as the "computer guru." If that technologically proficient person is a faculty member, a techno-prof, he or she provides the assistance at risk to their career. This risk is especially true at the beginning of a faculty career.

Instructor Young also typifies the mismatch between the recorded control policies of the organization which do not formally recognize nor reward citizenship behaviors. Reflecting on the amount of time and effort he puts into assisting others, he explained that "It’s nice to be wanted. I’m concerned about the bottom line too. I am concerned about my life, my family. It’s too bad that service isn’t rewarded more heavily."

Substitutability Effects - Beneficial

Ahrne (1994) posits that for an organization to survive, no individual affiliate can
be indispensable, they must be substitutable. Ahrne (1994) also realizes that individual affiliates can be "star" players or charismatic leaders, but that in the end, everyone within an organization must be replaceable. The possibility of succession must exist otherwise the organization would be harmed if an indispensable member were to leave. Techno-profs, contrary to this ideal, are caught between the world of disciplinary faculty work and their position as the departmental computer expert. Their disciplinary role is generally well prescribed and is the reason for which they were hired. Their role as the techno-prof makes them more valuable to the organization and hence less substitutable.

Techno-profs are tapped for their expertise and often asked for their opinions in the purchasing, use and policies related to technology. Since many of the existing faculty lack such knowledge and skills, techno-profs are often given a large voice in technological matters, regardless of the stage of their career (recent hire, junior faculty). Although technological expertise is often peripheral to their designated roles and responsibilities, it nonetheless provides them power within their institution, thereby reducing the likelihood of their replacement, independent of their value as a faculty member.

Substitutability Effects - Detrimental

Techno-profs can also be over-used for their technological knowledge. They can be over-assigned to technology related committees and hence be denied the opportunity to serve on other committees. All three techno-profs in this case report that they serve on several technology-related committees. The dean at Inland is aware that the same faculty tend to get assigned to technology-related committees again and again, to the detriment of
both the techno-profs, who form a clannish model of sorts (with the other techno-profs) to
the detriment of the mainstream faculty:

[Assigning the same faculty to every committee] comes back in several
ways. I think it also creates a cultish nature to technology. The
[mainstream] faculty who are waiting to be asked, or wanting to learn, feel
kind of disconnected. But, it is a clan model. Some clans are real
obvious: the Econ department, but some clans aren't as obvious -- such as
the techno-profs.

By having such narrowly focused assignments Techno-profs lose sight of the
larger view of the university, they may become burned out from constant assignment to
technologically-related committees.

Being the Techno-prof: Is it worth it?

The beneficial aspects of being a techno-prof include a heightened sense of self-
satisfaction, higher departmental status, access to new equipment, and access to new and
innovative projects. These dividends, while positive, consist mainly of short-term
benefits. Long term effects, on the other hand, may make assuming the role of the
 techno-prof more of a negative activity.

By focusing their attention to the voluntary service that comprises techno-prof
behaviors, techno-profs may ultimately jeopardize their promotion, as in the case of
Professor Gray, or they may become overwhelmed, as in the case of Instructor Young.

Do these three faculty think that being the techno-prof in the department was
worth their time and effort? None of the techno-profs answered with an emphatic "yes."
Professor Gray, the most senior of the three, said, "Yes, I think so. It’s rewarding for me. I much more prefer that to writing some dry dissertation about, you know, an author that we’re discussing."

When queried if being the departmental techno-prof is worth it, Professor Green responds:

Yeah, certainly the time and I guess the only other thing is the constant “siren call” of private business where I could make twice as much money doing half of what I do here. But that’s a decision I made when I decided to go into academia.

He is self-assured in his abilities and is confident he can help almost all who come to him. He enjoys assisting others and turns no one away.

The effects of being the techno-prof have been the most profound on Instructor Young. He has felt overwhelmed and was compelled to seek relief after two years.

You can’t do everything right. And you don’t want to be exploited. I really took a risk a couple of years ago and just really let the dean and my chair know that I was being overworked and that I couldn’t do everything, that it was a problem. So, I addressed that I was doing too much, it felt like a real risk but it also felt like I had to say something, otherwise I was just going to be crushed by all of the work, I would be completely overwhelmed. I would have physical reactions to the pressure or the stress, it was unbelievable.

When asked if he thought being a techno-prof in his department was worth the effort, he
responded:

Uh, (pause) I've asked myself that question, I'm not sure if it's worth it. Time will tell I guess, whether the efforts I've made will result in a benefit to me. At this point I feel like I've done a lot of work and I haven't been rewarded really, so we'll see. I haven't lost my job but I haven't gotten the raises either, so we'll see how things play out. I've certainly gotten a lot of knowledge that I can apply in different settings if I have to. If I were in a [different] track I would think there would be real drawbacks. I mean I wouldn't do this if I were on a different track. I would not be the computer guru. There is just no way because I would be focused on writing, teaching, research and publication.

Conclusions

Indeed in this case organizational citizenship behavior exhibited by techno-profs has both positive and negative ramifications for the organization as well as for the individual. OCB, as Organ (1988) notes, is discretionary individual behavior, which in the aggregate contributes to organizational effectiveness. In the main, techno-prof behavior tends to produce positive effects on the organization. On the other hand, techno-prof behavior tends to produce negative effects upon the individual’s career.

When organizations rely on OCB to solve their technology problems they send mixed messages by at first reinforcing techno-prof behavior with short term resource rewards, yet not rewarding these same faculty with increased salary, promotion, and
By relying so heavily on techno-profs to provide technological expertise and by providing them the most advanced technological resources, organizations in essence maintain these faculty in a position that benefits the institution, but is often detrimental to the individual. The investment required to keep the techno-prof apprised of the latest technology (and hence perpetuate their role as the departmental expert) is small compared to the major expenditure of funds needed to expand existing technical support structure. In this case, by providing good citizen faculty the means to continue in the role of the techno-prof, the organization benefits from their assistance-giving behaviors.

The placement of techno-profs on an inordinate number of technologically-related committees also runs the risk of burning out the faculty who are asked to serve. By not including a wider group of faculty on such committees a narrow technological viewpoint is promulgated throughout the institution. Similarly, if techno-profs are only asked for their opinions regarding technology, they miss being exposed to and involved in broader campus affairs.

Replacement of techno-profs is inevitable if the organization does not recognize organizational citizenship behaviors as meaningful part of the service requirement for promotion and tenure. Replacement would incur additional cost in money and time to the organization, since new faculty must be recruited, hired, and begin anew in the faculty role (when the learning curve is often the steepest). "As a matter of priority for faculty work, service now has an ambiguous importance at best. Community service is construed to mean the application of professional expertise to societal needs" (Plater, 1995, p.31).
Could not technological expertise applied to collegial needs also be construed as service?

When an individual relies upon OCB they tend to lull themselves into thinking that their citizenship contributions are so important that they relax their work on rewardable efforts. Techno-profs who are asked to serve on numerous technological committees can easily attribute an exaggerated worth to their technological abilities and importance to the organization as the university pays little heed to their contributions come promotion and tenure time. Hence they can believe that they are not substitutable, yet be placing their careers at risk.

The types of organizational citizenship behaviors (OCBI versus OCBO) evolve over time and shift according to career needs and status. Newer faculty tend to provide OCB directed towards both the organization and the individual in an attempt to become as valuable as possible to the organization. As they mature professionally, they become more selective and their helping behaviors turn more towards the individual.

Lastly, unless techno-profs can translate their organizational citizenship behaviors into recognizable scholarship, they are at risk.

Recommendations

The following recommendations are intended to assist techno-profs, their deans, and the IT administrators at their institutions in assessing the relationship between techno-profs and the university. Faculty organizational citizenship behavior can and should be encouraged, valued, and recognized for the organizational asset that it is.
Recommendations for the techno-profs

Techno-profs should determine the extent to which the efforts they perform are recognized by the annual review and promotion and tenure process at their institution. If service activities are an expectation, they should determine the extent to which significant technological assistance might be incorporated into that expected service role. One of the most valuable resources a faculty member possess is their time, therefore they should ensure that the time spent assisting others does not detract from their required duties and work expectations. Faculty must learn to say "no" when asked to provide assistance if doing so detracts from scholarly or teaching activities. When asked to provide assistance beyond their level of expertise, techno-profs should recognize the consequences of providing such service might have detrimental effects if the advice they give is incorrect. They should refer the requesting parties to another source for assistance. Boyer (1990) in Scholarship Revisited suggests that service might be considered applied scholarship when:

What should be included [as part of the scholarship application] are activities that relate directly to the intellectual work of the professor and carried out through consultation, technical assistance, policy analysis, program evaluation, and the like. (p. 36).

Therefore techno-profs who intend to continue providing citizenship must ensure that their service efforts are well documented, and when possible, connected to the faculty member's expertise and scholarly work. Despite the attractiveness of new equipment and the latest software, techno-profs should recognize that these tangible rewards pale in
comparison to achieving promotion and tenure. Long term goals should not be sacrificed for short term benefits.

Recommendations for Academic Deans

Techno-profs provide a valuable service to individual faculty members, to their departments, colleges and to their institutions as a whole. The amount of time techno-profs spend assisting others can be substantial and can detract them from their expected work roles. If the faculty is performing large amounts of assistance for his/her colleagues, deans should consider providing release time or titular/financial recognition for the techno-prof's efforts.

Faculty could be encouraged to make the connection between their techno-prof behaviors and recognizable scholarship during their annual reviews during the promotion and tenure process. By giving techno-profs advance notice that although what they do is valuable, they must also conform to prescribed standards of acceptable scholarship, it affords them the opportunity to make informed choices as to how to spend their time productively.

Deans should consider the organizational citizenship behaviors of techno-profs as a significant part of the service responsibilities of these faculty. This reconsideration might entail the reformulation of promotion and tenure guidelines to elevate faculty service to a more prominent status or at least recognize ad hoc citizenship behaviors that positively adds to the organization's functioning.

Policies regarding service should be disseminated to tenure-track faculty and promotion in a more definitive fashion and tenure committees should be engaged in a
discussion of the criteria for service and of the potential for rewarding technological service within the promotion and tenure process.

To prevent stressful overload of the techno-profs, deans should avoid placing them on every departmental, college and university committee related to technology. Although techno-profs may not complain, they often tire of seeing only one side of university governance. Secondary reasons to place other faculty on these committees are to get a broader perspective of technology as it appears to the less technologically proficient.

**Recommendations for Information Technology Administrators**

Information Technology Administrators should recognize the existence and contributions of techno profs. They also need to understand the scope of assistance that techno-profs are providing. With this knowledge, the strengths, weaknesses, and gaps in the current support structure can be identified more readily and the ITA can then design a better technology support system.

**Recommendations for Further Research**

Further investigation should be undertaken to see if the phenomenon of the techno-prof exists in other disciplines and at other classifications of colleges and universities. This case study identified faculty in a small segment of the humanities, and further case studies could determine if the similarities and differences between the techno-profs in this case and those identified in other fields (the sciences, allied health, engineering, etc.) exist. A study of the promotion and tenure policies at different institutions could also be performed to determine which systems best identify, value, and
reward techno-prof behavior. Research of the effects of the "20 Flowers" types of small technology grants as proposed by Steven Gilbert (AAHESGIT 32/2, 1997b) could help determine what impact such grants have towards diffusing technology across an institution.

For this study the number of techno-profs studied was limited and they were studied in a cross-sectional methodology. A longitudinal study of techno-profs that includes more faculty who are located at different stages of their careers could identify the long term positive and negative effects in ways the current study was unable to discern. Further research is warranted which considers the impact of institutional culture and institutional change as moderators or initiators of technological innovation.

The financial effects of techno-prof behavior upon the organization is also of interest, and the study of such effects is also recommended. The economic impact of techno-prof behavior is of interest to administrators and might be studied by determining the amount of time techno-profs spend assisting others, what types of assistance are provided, and what savings are realized since other resources were not expended to solve the problems.

The impact of Technical Support Persons (TSPs) or Departmental Liaisons (DLs) on the use of techno-profs should also be examined. The current trend in the proliferation and use of TSPs and DLs, which embody a distributed approach to providing faculty support, may affect the dependence on techno profs.

A study of the recipients of techno-prof behaviors upon their colleagues could also lead to better understanding of faculty training. The current study did not include
responses from the faculty who seek techno-prof assistance. By examining this group of faculty, specific deficiencies in the services that current technology support services offer as well as which services the mainstream faculty are more inclined to use could both be better delineated and understood.
APPENDIX A
Initial E-Mail to Departmental Faculty
Dear Professor [Name]:

I am in the process of conducting my dissertation research in Higher Education for the School of Education at the College of William and Mary. My research topic concerns the impact of organizational citizenship behaviors (OCB) upon technically proficient faculty (techno-profs) in colleges and universities. As the use of technology diffuses across higher education, some faculty become identified as the "experts" to which their colleagues go for help and advice. The results of this study will help identify exactly what assistance these "techno-faculty" provide, and the impact their helping behaviors have upon their academic careers.

The Provost has approved my survey of your department so that I might identify the person or persons YOU might go to for computer/technological help. I have created a very short, four question survey located at the web page link at the end of this message. I would appreciate your completing the web-based survey before March 22nd. I cannot begin the second (interview) phase of my research until I complete the analysis of this survey data. The average time to complete the survey has been three minutes. All responses will remain confidential and your participation is voluntary.

If you have any questions about this research, please contact me at ssechris@odu.edu or call me at (757)683-4702.

Now, to complete the web-based survey, click on the following URL:
http://www.odu.edu/~srs/survey/survey.cgi?id=123

Thank you.

Scott Sechrist, EdS
Program Director
Nuclear Medicine Technology
Old Dominion University
APPENDIX B
World Wide Web Survey
Welcome. Thank you for agreeing to help with my study. The purpose of the following four questions is to determine which of the faculty members in your department is sought out for technological assistance. All of your responses will remain confidential and only the faculty member (or members) identified as the go-to person by his/her peers will be contacted for further information.

For each question, select the person (or persons) that you seek out when you need assistance with the particular technological problem listed. Even if your first choice is to use another means to solve your problem (help desk, manuals, figure it out yourself, ask graduate students), attempt to determine the faculty member you would go to for technological assistance.

If the faculty member is not listed in the choices provided, please provide their name in the next space available. If you never seek out a faculty person, choose never ask fellow faculty for assistance. If you seek out someone else in the department (a student, staff), choose other as your response and then provide that individual’s name in the space provided.

Question 1.
When you need assistance with hardware problems (any computer, printer, scanner or peripheral problem, etc.), the person(s) you seek out is:

First Choice: [Faculty member]
Second Choice: [Faculty member]

If you selected Other, or Other Faculty not listed please provide name/person not listed:

If you selected Other, or Other Faculty not listed please provide name/person not listed:

Question 2.
When you need assistance with software problems (installing and using word processing, spreadsheet, statistical, presentation, any proprietary programs, etc.), the person(s) you seek out is:

First Choice: [Faculty member]
Second Choice: [Faculty member]

If you selected Other, or Other Faculty not listed please provide name/person not listed:

If you selected Other, or Other Faculty not listed please provide name/person not listed:

Question 3.
When you need assistance with network, Internet or World Wide Web problems (configuring and using e-mail, browsers, Web page construction, file transfers, etc.), the person(s) you seek out is:

First Choice: [Faculty member]
Second Choice: [Faculty member]

If you selected Other, or Other Faculty not listed please provide name/person not listed:

If you selected Other, or Other Faculty not listed please provide name/person not listed:
Question 4.
When you need assistance with the instructional use of technology problems ("how to" questions concerning incorporating hardware, software and the Internet into your courses), the person(s) you seek out is:

First Choice: Faculty member

If you selected Other, or Other Faculty not listed please provide name/person not listed:

Second Choice: Faculty member

If you selected Other, or Other Faculty not listed please provide name/person not listed:

Submit Form
APPENDIX C
Follow-Up E-mail to Departmental Faculty
Dear Professor [Name]:

Greetings! If you've responded to my original e-mail request of March 16th - Thank you! I was truly surprised to have gotten so many responses.

If you haven’t responded but still wish to do so, I would truly appreciate your assistance in my dissertation research. The web address at the end of this message will take you to my four-question survey on technically proficient faculty members. By clicking on the hypertext link below and answering a few questions you will be assisting me greatly.

As before, all responses are voluntary and confidential. This study has been approved through the Provost's office and I would appreciate your response by March 29th. I will not send any more requests or follow-up messages.

http://www.odu.edu/~srs/survey/survey.cgi?id=226

Thanks again!

Scott Sechrist, EdS, CNMT
Associate Professor and Program Director
Nuclear Medicine Technology
Old Dominion University
ssechris@odu.edu
APPENDIX D
Sociograms - Coastal University
Social Network Analysis - Identification of the Techno-Prof(s)
[Humanities] Department Faculty - Coastal University
Composite choices - Questions 1-4

Note: Actors with no lines did not choose a departmental faculty member and chose another means to obtain assistance
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Coastal University

Question 1 - When you need assistance with **hardware** problems, the person(s) you seek out is:

Note: Actors with *no* lines did *not* choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice

► = first choice  ►  = second choice
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Coastal University

Question 2 - When you need assistance with software problems, the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice.

= first choice          = second choice
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Coastal University

Question 3 - When you need assistance with network, WWW or internet problems, the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice

\[\text{first choice} \quad \rightarrow \quad \text{second choice} \]
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanites] Department Faculty - Urban University

Question 4 - When you need assistance with the instructional use of technology, the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice

= first choice          = second choice
APPENDIX E
Sociograms - Inland University
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Inland University

Composite Choices - Questions 1 - 4

Note: Actors with no lines did not choose a departmental faculty member and chose another means to obtain assistance.
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Inland University

Question 1 - When you need assistance with hardware problems, the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice.

► = first choice  
—► = second choice
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Inland University

Question 2 - When you need assistance with software problems, the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice

►  = first choice

--------► = second choice
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Inland University

Question 3 - When you need assistance with network, WWW or Internet problems,

the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice

= first choice     = second choice
Social Network Analysis - Identification of the Techno-Prof(s)

[Humanities] Department Faculty - Inland University

Question 4 - When you need assistance with the instructional use of technology, the person(s) you seek out is:

Note: Actors with no lines did not choose a departmental faculty member to ask for assistance, and some chose a faculty member only as a second choice

- - = first choice

- - = second choice
APPENDIX F
Cover Letter - Provosts
October 13, 1998

Dr. [Name]
Provost
Administration Building
Coastal University
City, State

Dear Provost [Name]:

The proposal for my dissertation, "Organizational Citizenship Behaviors in Technically Proficient Faculty" was recently approved. My study will identify the faculty person whom other faculty seek out for assistance with their computer and technology-based problems. The study will also explore the types of citizenship behaviors these techno-faculty provide and the impact their behaviors have upon their careers. Given the rapid diffusion of technology in higher education and the growing inability to provide support in the use of this technology, faculty often prefer collegial help when they need technical assistance. Very little has been written on the subject of the techno-faculty, that individual who provides valuable assistance to the organization even though these behaviors are discretionary and not recognized by the formal reward system.

I am therefore requesting permission to contact and interview the Dean of [College] at Coastal University and to survey the faculty in one or more departments in order to identify the most technically proficient faculty and then to obtain an in-depth interview with that faculty member.

My committee chair is Dr. Dorothy Finnegan, who can reached at the following e-mail address: wildbill@wxs.nl

Thank you for your assistance in my study.

Sincerely,

Scott Sechrist, EdS
Program Director, Nuclear Medicine Technology
Interview Schedule for Techno-prof OCB Study

The research problem being addressed in this study is to determine if technologically proficient faculty (techno-profs) within various university departments provide similar technological contributions to their units, exhibit characteristic organizational citizenship behaviors (OCB), and experience positive or negative effects on their careers as a result of these discretionary behaviors.

For faculty who work at institutions with overburdened computer support staffs, keeping current with technologic advancements in higher education has become increasingly difficult. Faculty are often more prone to turn to departmental “gurus”, the techno-profs for assistance. With computers, software, network and internet related questions, no matter how simple or complex. The techno-faculty, once identified become a focal point for assistance at the departmental level. The assistance they render is often, if not always outside the scope of their normal duties and responsibilities, and can be referred to as a citizenship behavior.

Organizational citizenship behavior is defined as individual voluntary behavior that in the aggregate aids organizational effectiveness but is neither a requirement of the individual’s job nor directly rewarded by the formal system. (Organ, 1985). Williams and Anderson (1991) have further divided OCB into two main categories behaviors directed towards an individual (OCBI) and those directed towards the benefit of the organization (OCBO).

For this study I am interested in discovering the types and scope of technologic assistance provided by departmental techno-profs and to determine the effects that being the techno-prof has on the faculty member him/herself.

For this study, I will be interviewing technically proficient faculty from the English departments at two different institutions and I will also be interviewing the deans of the colleges wherein those departments reside. This interview will be recorded.

Do you have any questions before we begin? Thanks in advance for your willingness and cooperation to be part of my study.
I. Interview Schedule - Techno-prof Faculty

For this portion of the interview, I am interested in understanding your own educational, employment and technologic background:

A. Educational/Academic/Technologic background:

1. Please describe your formal education to date: (Institutions, major areas of study, dates)

2. What is your current title (assistant/associate professor or other)?

3. How long have you been employed in your current position?

4. Approximately how many faculty work in your department/academic unit?

5. Overall, how technologically proficient (facility with computer hardware, software, WWW, educational uses) do you consider yourself?

   Probe: In what area(s) do you consider yourself most proficient?

   Probe: How did you come to be technologically proficient in these areas?
   (self-taught, formal courses, other)

6. How long have you been using computer technology?

   Probe: Do you use computer technology at home?

7. Where do you go for assistance in technical matters?

   Probe: Do you have a techno-prof you rely on for assistance?

   Probe: Are you aware of other techno-profs in your department? (college, institution?)

8. What technologically oriented committees have you/do you serve on?

   Probe: Do you feel others closely identify you as being a technically proficient faculty member?

   Probe: Is it ever assumed you are more technically competent than you really are?
   (placed on committees, asked to assist in problems beyond your expertise)
B. Organizational Citizenship Behaviors

For this part of the interview I am interested in determining what types of technologic assistance you provide to your colleagues and why.

9. What kinds of assistance do you provide? (List)

Probes: Do faculty ask you for assistance with hardware problems?
Do faculty ask you for assistance with software problems?
Do faculty ask you for assistance with WWW/Internet questions?
(Searches, navigation, setup/preferences).
Do faculty ask you for assistance with the academic uses of technology
(web page construction, employing CD-ROMs in courses).
Other:

10. Why do you think faculty come to you and not use other means to obtain assistance?

11. How do people know you are the person to come to?

12. To whom do you provide assistance? (Faculty only, staff, students, others)

13. Is there assistance that you provide to individuals which differs than that from assistance to the department/college as a whole?

Probe: Of the assistance you’ve mentioned, what portion do you provide to individuals? (OCBI)

Probe: Of the assistance you’ve mentioned what portion do you provide that helps the department/college? (OCBO)

Probe: Are there “repeat customers”, faculty who tend to ask for more assistance than others?

14. Do you ever withhold assistance?

Probe: Why do you withheld assistance? From whom? In what instances?

15. Do you consider your behaviors to be part of your faculty role?

Probe: Would you prefer that these behaviors be part of your assigned role?
16. Why do you provide the assistance you do?

Probe: What are the advantages to you by being the techno-prof? (benefits)

Probe: What are the disadvantages to you by being the techno-prof? (drawbacks)

17. What impact has providing technologic assistance had on your daily work?

Probe: Do you ever think to yourself that you should be doing other work while you are assistance someone with a technologic problem?

18. How much time per day/week/month is spent providing assistance?

Probe: Is the time spent helping faculty increasing or decreasing over time?

19. What are the departmental/college attitudes towards the use of technology in your discipline? (accepted, encouraged, discouraged).

20. What long term consequences do you feel being the techno-prof has had on your career thus far?

Probe: If tenured, has being the techno-prof helped or hindered your achievement?

Probe: If non-tenured, what impact do you think being the techno-prof will have on your academic advancement.

21. How satisfied are you with your present position?

22. Being the techno-prof for your department - is it worth it?
APPENDIX H
Interview Protocol - Deans
II. Interview Schedule - Deans

Briefly, for this portion of the interview I am interested in discovering information regarding your background and academic career:

A. Background

1. How long have you been dean of the College?
   
   Probe: Were you a faculty member (where, when, discipline, how long).

2. Please describe your educational to date: (Institutions, areas of study, dates).

B. Technology diffusion and faculty assisting other faculty:

For this portion of the interview, I am interested in understanding the diffusion of technology in your College - specifically concerning faculty assistance of other faculty in the use of technology.

3. How would you characterize the impact of computer technology in your College?
   
   Probe: How has computer use changed over time? (last five years, last two years?)

4. If the use of technology is expanding, how has that affected faculty roles and expectations?
   
   Probe: When hiring new faculty, do you specifically look for technologic proficiency?
   
   Probe: What types of proficiencies do you seek?

5. Do all faculty have access to computers on their desks?
   
   Probe: How are faculty trained in the uses of technology?
   
   Probe: Is there a training system/funding protocol for training or is it a more random process? Left up to the departments? Individual faculty?

6. Are there faculty who assist other faculty in the use of computer technologies in your college?
   
   Probe: How valuable are they to the organization?
Probe: Are the activities they provide discretionary or part of their faculty role? (OCB or merely collegial assistance)

7. Are these techno-profs rewarded or recognized for what they do?

Probe: Is the recognition they receive formal or informal?

8. Could you estimate the number of techno-profs are there in your College?

9. Would say that the assistance these techno-profs provide assists individuals, the organization, both?

Probe: Could you clarify/expand on your response (examples?)

10. Are the techno-profs purposively placed on committees and in assignments related to technology?

11. Is technical competence recognized within the formal promotion and tenure process?

Probe: Do you think being the departmental techno-prof enhances or jeopardizes an academic career path (promotion and tenure)?

12. When you personally have a computer problem, how do you resolve the problem? (Help desk, work it out, techno-prof?)

Probe: Do you have a techno-prof you call on for computer assistance?

Probe: What types of assistance do you seek? (hardware, software, educational, administrative uses).
APPENDIX I
Interview protocol - IT Administrators
III. Interview Schedule - Information Technology Administrators

Briefly, for this portion of the interview I am interested in discovering information regarding your background and academic career:

A. Background

1. What is your current title/rank/position within the university?

   Probe: Exactly what are your duties/areas of responsibility at his institution?

2. How long have you been at this institution?

   Probe: Do you hold faculty rank?

   Probe: Were you ever a faculty member (where when, discipline, how long)?

3. Please describe your education to date: (degree/institutions, areas of study, dates)

B. Technology diffusion and faculty assisting other faculty:

4. Is “assisting faculty integrate IT into instruction a major challenge at your institution? (One of the 2 top challenges as reported bin Ken Green’s Survey - 1998)

   Probe: If yes, why do you think this is true? How effective is IT support from the institution?

   Probe: What steps is your institution taking to address the problem?

   Probe: Do faculty help other faculty use technology at your institution?

   Probe: How do faculty help each other?

   Probe: Would you prefer faculty did more or less helping? Should (could) this assistance be more structured?
For this portion of the interview, I am interested in understanding the diffusion of technology at your institution, especially among the Faculty - specifically concerning faculty assistance of other faculty in the use of technology.

5. How would you characterize the impact of computer technology in your institution?
   
   Probe: How has computer use changed over time? (last five years, last two years?)
   
   Probe: Can you give me a history of computer use at your institution?
   
   Probe: Is the use expanding? To what do you attribute the expansion?
   
   Probe: What efforts are made at the university or school levels to expand the use of technology by faculty? Financial? Capital investment? Training programs/services?

6. Is there a Strategic Planning process for Information technology at your institution?
   
   Probe: Is there a separate IT plan, or is it part of the overall Strategic Plan?
   
   Probe: Are faculty involved with the creation and implementation of your IT plan? If so, how do these faculty become involved? Picked? Volunteer? Representation?

7. How are faculty trained in the uses of technology?
   
   Probe: Is faculty training a formal process or is it a more random process? Is it left up to the schools or departments? To the individual faculty?
   
   Is this training funded?

8. Is there a Technology Resource Center/Center for Learning Technologies at your institution?
   
   Probe: What services does this center provide?
   
   Probe: Is there a formal program to support faculty development projects related to technology?

   Probe: Do faculty use the service? Why or why not?

9. Are you aware of a formal recognition process to reward technology related projects as part of the promotion and tenure process?
For the next series of items, I am interested in how your institution assists faculty in the use of technology. By support structure I mean the gamut of services from the help desk up to one on one faculty assistance:

10. Has a formal or informal evaluation or assessment been done on the effectiveness of the IT Center and/or services?

11. How effective is the university support structure/help desk in assisting faculty:
   a. with hardware?
   b. with software/new applications/proprietary programs?
   c. with the uses of the Internet/WWW (from setup to use of e-mail, research, web design)
   d. with educational uses of technology? (Web based, web-enhanced courses, audio/video applications, WWW discussion groups)

12. If the use of technology is expanding on campus, has it affected faculty roles and the institution's expectations of faculty work?

13. Are there faculty who help other faculty in the use of computer technologies in your institution?
   Probe: Do you use technologically proficient faculty to help diffuse technology at your institution?
   Probe: Are the techno-profs recognized formally or informally?
   Probe: Why do you think they provide assistance?
   Probe: How valuable are they to the organization?
   Probe: Are the activities they provide discretionary or part of their faculty role?

14. Could you estimate the number of techno-profs there are at your institution?
15. Would you say that the assistance these techno-profs provide helps individuals or the organization?

Probe: Could you clarify/expand on your answer?

16. When you personally have a computer problem, how do you resolve the problem? (Help desk, work it out, techno-prof?)

Probe: Do you have a techno-prof you call on for computer assistance for personal or organization computer problems?

Probe: What types of assistance do you seek? (hardware, software, educational, administrative uses).
APPENDIX J
Cover letters to Techno-profs, Deans, IT Administrators
Requesting Interviews
March 1, 1999

Dr. [Name]
Humanities Department
Inland University
City, State

Dear Dr. [Name]:

The proposal for my dissertation, "Organizational Citizenship Behaviors in Technically Proficient Faculty" was recently approved in the School of Education at the College of William and Mary. The initial part of my research was performed to identify the faculty person whom other faculty seek out for assistance with their computer and technology-based problems. Given the rapid diffusion of technology in higher education and the growing inability of institutions to provide support in the use of this technology, faculty often prefer collegial help when they need technical assistance. Little has been written about the technologically proficient (techno-profs) faculty, those individuals who provide valuable assistance to the organization even though their behaviors are personally discretionary and often not recognized by the formal reward system.

My web-based survey has identified you as one of those techno-faculty. I would greatly appreciate it if you would consent to an interview concerning your status as a technically proficient faculty member in the [Humanities] Department. I can meet at your convenience and the interview should take approximately 90 minutes to complete.

I have received permission from Provost [Name] to conduct my research in the [College housing Humanities Department] at Coastal University.

My dissertation chair is Dr. Dorothy Finnegan, a member of the School of Education, The College of William and Mary, and can reached at the following e-mail address: wildbill@wxs.nl

Thank you for your consideration of and assistance in my study. You may e-mail me at ssechris@odu.edu or call me at 3-4702 if you have any questions or wish to set up an interview. I will telephone your office next week to determine your decision.

Sincerely,

Scott Sechrist, EdS
Program Director, Nuclear Medicine Technology
Old Dominion University
March 23, 1999

Dr. [Name]
Dean, College
Coastal University
City, State

Dear Dean [Name]

The proposal for my dissertation, "Organizational Citizenship Behaviors in Technically Proficient Faculty" was approved in the School of Education at the College of William and Mary. The project will consist of interviews of deans and faculty at two colleges in [State]. The initial part of my research was performed to identify the faculty person (or persons) whom other faculty seek out for assistance with their computer and technology-based problems. Given the rapid diffusion of technology in higher education and the growing inability of institutions to provide support in the use of this technology, faculty often prefer collegial help when they need technical assistance. Little has been written about the technologically proficient (techno-profs) faculty, those individuals who provide valuable assistance to the organization even though their behaviors are personally discretionary and often not recognized by the formal reward system.

I received permission from Provost [Name] to conduct my research in the College [Housing Humanities Department] at Coastal University and I write you today to ask your permission to interview you concerning the diffusion of technology in your College. I would greatly appreciate it if you would consent to an interview concerning your thoughts and experiences concerning technically oriented faculty and how they are viewed within your College.

I can meet at your convenience and the interview should take approximately 60 minutes to complete.

My dissertation chair is Dr. Dorothy Finnegan, a member of the School of Education, The College of William and Mary, and can reached at the following e-mail address: wildbill@wanadoo.fr.

Thank you for your consideration of and assistance in my study. You may e-mail me at ssechris@odu.edu or call me at 3-4702 if you have any questions or wish to set up an interview. I will telephone your office next week to determine your decision.

Sincerely,

Scott Sechrist, EdS
Program Director, Nuclear Medicine Technology
April 15, 1999

Dr. [Name]
Information Technology Administrator
Inland University
City, State

Dear Dr. Smith:

The proposal for my dissertation, "Organizational Citizenship Behaviors in Technically Proficient Faculty" was approved in the School of Education at the College of William and Mary. The project will consist of interviews of deans and faculty at two colleges in [State]. The initial part of my research was performed to identify the faculty person (or persons) whom other faculty seek out for assistance with their computer and technology-based problems. Given the rapid diffusion of technology in higher education and the growing inability of institutions to provide support in the use of this technology, faculty often prefer collegial help when they need technical assistance. Little has been written about the technologically proficient (techno-profs) faculty, those individuals who provide valuable assistance to the organization even though their behaviors are personally discretionary and often not recognized by the formal reward system.

I have received permission from Provost [name] to conduct my research in the [College housing the Humanities Department]. I would greatly appreciate it if you would consent to an interview concerning your thoughts and experiences concerning the diffusion of technology and technically oriented faculty at Inland University.

I can meet at your convenience and the interview should take approximately 60 minutes to complete.

Thank you for your consideration of and assistance in my study. You may e-mail me at ssechris@odu.edu or call me at (757) 683-4702 if you have any questions or wish to set up an interview. I am sending a copy of this letter via e-mail as well. I will telephone your office next week to determine your decision if I haven’t heard from you sooner!

Sincerely,

Scott Sechrist, EdS
Program Director, Nuclear Medicine Technology
Old Dominion University
REFERENCES


Shuster, J., (1990). The need for fresh approaches to faculty renewal, in *Enhancing Faculty Careers*, San Francisco: Jossey-Bass


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VITA

Scott Richard Sechrist

Birthdate: June 23, 1953

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Education:

1991 - 2000 The College of William and Mary
   Williamsburg, Virginia
   Doctor of Education
   Education Specialist

1987-1989 Old Dominion University
   Norfolk, Virginia
   Master of Science

1978-1979 University of North Carolina
   Chapel Hill, North Carolina
   Certificate in Nuclear Medicine Technology

1971-1975 Old Dominion University
   Norfolk, Virginia
   Bachelor of Science