

RMIR

RESEARCH MANAGEMENT REVIEW

*The Journal of the National Council
of University Research Administrators*

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Research Management Review

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of University Research Administrators**

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Editor’s Preface.....2

Time Management for the Research Administrator.....3
by Shelley Hesselton-Mangan

Best- and Worst-Practices in Research Administration11
by Lynn E. Miner, Jeremy T. Miner, and Jerry Griffith

Assessing the Needs of a Changing Faculty21
by Thomas D. LeBlanc, Robert M. Jackson, and Jeff Wright

How Ethics Can Advance High-Tech Linkages Between Universities and
Industries.....31
by John K. Yost

Authors44

EDITOR'S PREFACE

This issue of *Research Management Review* represents an eclectic mix of topics important in the field of research administration. This mix represents the practical and the theoretical, important dimensions for the research administrator.

Ms. Shelley Hesselton-Mangan's "Time Management for the Research Administrator" starts off the issue. The efficient and effective utilization of time is a skill important in most careers, but is especially important in research administration. This is due to the prevalence of deadlines and faculty demands. Her article represents an excellent primer on "how to" in time management for the research administrator.

Have you ever thought about what the best and worst practices in research administration are? If not, now is the time to read "Best- and Worst-Practices in Research Administration" by Dr. Lynn Miner, Mr. Jeremy Miner, and Dr. Jerry Griffith. Drawing upon their substantial experience in research administration and grantsmanship, Dr. Miner and his colleagues take a broad perspective, placing best practices within the framework of organizational behavior that encompasses the attributes of competence, culture, change, and communication. As such, the article advances the practice of research administration.

What does it mean to be a teacher-scholar at a predominantly undergraduate institution? "Assessing the Needs of a Changing Faculty," by Dr. Thomas LeBlanc, Dr. Robert Jackson, and Mr. Jeff Wright, documents how the Office of Sponsored Programs at California State University-Chico assessed the needs of a changing faculty at their institution, a predominantly undergraduate institution dealing with the issue of research and extramural funding. Their survey of college deans, department chairs, and new tenure-track faculty illustrates areas of agreement and disagreement. This is a must read for smaller colleges and universities that are trying to balance teaching and research/extramural funding.

Closing out this issue is Dr. John Yost's "How Ethics Can Advance High-Tech Linkages Between Universities and Industries." NCURA is quite involved at the present time with the overall state of university-industry partnerships, but the ethical dimension of these partnerships is not typically discussed at great length in the field of research administration. As the most theoretical article in this issue, it leaves the reader pondering some of the great questions facing universities in general and research administration as a profession.

In closing, this issue reflects the complexity of research administration: balancing the practical and the theoretical, striving to improve the daily practice of the field, working with faculty in a true partnership, and keeping one eye on the present and one on the future. A heady mix indeed.

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AUGUST 2003

Time Management for the Research Administrator

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ABSTRACT

The field of research administration has long been characterized by seemingly endless crises and deadlines, mountains of paperwork, bureaucratic red tape, and the pressure to do more with less. As our field spends more time looking to manage stress and anger on the job, we should also be looking at better time management.

In this article, some of the main problem (time-consuming or wasteful) areas of research administration are discussed, including organizing, planning, scheduling, breaks, managing interruptions, delegating tasks, and managing time at home. Personally used and adopted time management practices are suggested and some of the time management techniques and practices found through researching the subject are analyzed. Since most techniques are geared toward the business world, practical uses for them in research administration are suggested. The article concludes with a discussion of the importance of adopting new time management techniques.

INTRODUCTION

I have worked for many different companies in various areas of accounting over the course of my career, but none have proved to be as demanding, and equally as rewarding, as when I started a career in research administration at the University of Massachusetts Medical School. It took very little time for me to learn that the mottos of the research administrator, here and at all other similar institutions, are “So much to do, so little time” and “It’s due when and you’re giving it to me now?”

As research administrators, we are burdened with grant proposal application deadlines, budget deadlines, and monthly, quarterly, and yearly financial reporting deadlines. We are challenged by uncommunicative and/or procrastinating faculty and by the often serious understaffing of our departments. We have to deal with constant interruptions, urgent and non-urgent, since our doors (and telephones and email) are always open to our faculty and staff, as well as to internal and external constituents. We usually find ourselves caught in a whirlwind of procedural changes and

technological upgrades while simultaneously mired in age-old bureaucratic red tape and paper pushing.

As a profession, research administrators work well over the normal 40 hours per week. We take work home too often, and more than occasionally find ourselves in our offices late in the evening or on the weekends. It didn't take long for me to realize that learning and adopting time management practices would be necessary, not just to be successful in my new career, but just to avoid total burnout and maintain my home, family, and personal life.

I had actually never read any material on time management, and the tricks I already knew I had picked up from other professionals I had interacted with. So, I started researching the subject of time management, and what better environment for this research than a research institution? As a result, one evening I sat at my office computer and searched the Internet for time management articles.

I found important articles on time management, covering best practices, best techniques, tips, suggestions, mistakes, and do's and don'ts. Since the field of research administration is unique in many ways and differs greatly from the norm of business management, I outline here what I have found to be best applied to research administration and combine these ideas with my own practices and suggestions.

BEST PRACTICES & TECHNIQUES

Organization

My best and most trusted time management practice is organization: I whole-heartedly believe in "A place for everything and everything in its place." A little bit of obsessive-compulsiveness can be a good thing. Never mind the signs that say, "A clean desk is the sign of a sick mind," since people with messy desks or work areas can waste over an hour each day just looking for paperwork and files.

Despite the technological push towards a "paperless" society, research administrators are still responsible for such an extensive amount of paperwork and documentation that proper organization and a comprehensive filing system is a must. Without them, we would spend an exorbitant amount of time just trying to find the "back-up" that everyone constantly asks us for. As a rule, I keep small binders with often-used resource information on a shelf above my desk within arm's reach for quick access. Other less used reference manuals or books I place on shelves on the other side of my office. I do the same with my files, which I like to color code according to category. For example, my different account files are yellow, orange, green, and purple, depending on the type of account (such as grant, gift, endowment, or institutional); my personnel files are blue; and my purchasing files are red. This makes for quick and easy location of specific types of documentation.

I have a shelf with vertical slots for the file folders in which I keep faculty grant proposals that I have mailed out. This separates pending and funded proposals, so that when I receive an award notice, it is easy to match it up with the proposal application and file away. I have tiered in and out boxes for papers and mail that come into and out of my office, which I sort according to the

action required, i.e., copies for filing, invoices to pay, memos I must distribute, or forms I must fill out and return.

I try to avoid starting piles of papers around the edges of my desk, unless it is a project (or projects) I am continuing work on over a short time period. I have a section of my desk outlined as my “workspace,” with my pens, stapler, paperclips, etc., arranged around it. Every night before I leave, I make sure that space is cleared of papers and objects. I also insisted on having my own printer so that I don’t have to run back and forth to a shared network printer every time I print something (which is all the time).

Planning and Scheduling

In researching time management, a top five time management mistake was to start the day without a plan of action. Without a plan, the day starts by responding to the “squeaky wheel” and continues with spending the rest of the day in a defensive mode, continually reacting to others’ demands (Whetmore, 2001). After reading this, I realized I rarely plan out my day at work, other than to identify the projects I need to work on or finish, and I do allow others’ needs (mostly faculty) to dictate what I do each day. This was definitely something that I needed to work on.

Another article outlined time management for “busy” managers (as if there are managers who are “not busy”). Time management was defined as “controlling the use of your most valuable (and undervalued) resource”, and the absence of time management was described as being characterized by “last minute rushes to meet deadlines, meetings which are either double-booked or achieve nothing, days which seem somehow to slip unproductively by, [and] crises which loom unexpected from nowhere” (Blair, n.d.). This struck a familiar chord with me and described the atmosphere of my office quite well.

Too many evenings and weekends working late, the final panic toward the end, and the last hectic hours marred by errors are characteristic of the research administrator’s office during two particular events. The annual departmental budget submission is one event and grant proposal submissions are the other event. I found that the suggested basic techniques for planning and scheduling for projects were (1) checking the specifications of the project so that what is to be done is clear; (2) breaking the task down into small sections so that the time taken for each can be estimated; and (3) scheduling reviews of the project’s progress (Blair, n.d.).

These techniques can definitely be used with the annual departmental budget submission, which comes every year at the same time. Planning ahead and not ignoring the deadlines, because at the time they seem so remote, to avoid the usual last-minute crunch keeps us out of the office on those evenings and weekends and saves us the need to take time off to recuperate after the budgets are done.

But these techniques may not always work for the other event—grant proposal submissions. These have a wide variety of deadlines throughout the year, depending on the sponsor, and we research administrators are often the last to know when a faculty member is planning to submit one. Coupled with faculty tendencies not to communicate their plans to us and procrastinate until the very end, we are faced with having the proposal dropped on our desk with a day or two for us, the head of our department, and the research office to review it. In other words, we are often handed impossible deadlines that affect all parties in the grant review process.

One article described four ways to deal with impossible deadlines: (1) get the deadline extended; (2) scream for more resources; (3) get the deliverable redefined to something practical; and (4) state the position clearly so that your boss (and his/her boss) has fair warning (Blair, n.d.). These techniques, although useful in other situations, are not useful for research administrators. Grant deadlines are grant deadlines, and they are usually not extendable except under extenuating circumstances and after obtaining prior sponsor approval. Screaming for more resources is quite often not an option in our non-profit, budget-limited institutions, and there is no way to redefine a grant proposal to make it practical. We end up stating our position clearly to the department head and the research office staff, though, by blaming the faculty when we apologize for the last-minute urgency as we run into their offices with the grant proposal in hand.

I found a much better solution to this elsewhere, in an article that called these situations “predictable unforeseen events that come from other people.” The author termed this as “chronophagia,” which includes “tasks delegated at the very last minute, projects gathering dust on someone’s desk until the person in charge realizes that they should have been finished yesterday... and so on” (Gammonet, n.d.). If we continue to experience this, then these “unforeseen” events become “predictable” and we should plan ahead for them. In this instance, we fall back on the old adage that “an ounce of prevention is worth a pound of cure,” and we should not wait for these “unforeseen events” to come to us—we should go to them (Gammonet, n.d.).

I realized that taking a more proactive stance with faculty might help me avoid a lot of these last-minute grant proposal submission deadline crunches. I drafted a memo to the faculty, outlining the review process and amount of time needed for each step, insisting that the proposals reach my office within the given time frame, and warning that if they did not, I could not guarantee they would be ready to mail out by the deadline.

I follow up on this memo by sending emails, making phone calls, or dropping by their offices to quickly ask them what their current plans are or to get an update on any works in progress. If they want, I can schedule more formal, longer meetings to discuss their plans and goals in more depth. This helps remove the lack of communication, and also enables me to intervene if I sense procrastination. By telling them that I would like to assist them in reviewing their proposal drafts as they go along, I can quickly review the drafts ahead of time and save myself the frustration of reviewing it all at the last minute.

Taking Breaks

One thing I always try to do is take small breaks throughout my day. I find I become less productive as my eyes get tired, my back gets sore, and my fingers get achy when I insist on staying at my desk and continuing to plug away. My eye doctor informed me that people who spend a considerable amount of time on the computer should take 10-minute breaks from it every hour. This reduces eyestrain and the fatigue and headaches that can result from it.

I usually try to find a place in what I’m working on where, if I stopped, I would be able pick it up with little difficulty, and then take a walk. I often have to deliver or pick up forms and paperwork to and from various other departments in the building, so I find it productive to plan where I need to go during the day and make those my walks. It gets me out of my office, away from my computer, and allows a refreshing break without compromising my productivity.

Along with breaks, I try to always eat lunch someplace other than at my desk and not to do work while I'm eating. I stopped doing the crossword puzzle in the daily newspaper in the morning and started doing it at lunch instead. I find it clears my mind and gears me up for the rest of the afternoon. Studies have shown that those who work through their lunch period in the hopes that it will give them more time to produce results actually experience the opposite effect (Whetmore, 2001). I also try not to schedule personal appointments (doctor, dentist, etc.) during my lunchtime or at odd times of the day. I schedule them either early in the morning or late in the day to avoid having to run out in the middle of my workday and then end up eating lunch on the run.

Managing Interruptions

As the central resource for their department, a research administrator's door is always open, lending itself to a multitude of phone calls and drop-ins. Faculty often drop by unscheduled when they have a few minutes between classes or patients, and staff, especially new ones, frequently pop in to ask quick questions. This is highly typical of my office, and a time management problem I hadn't considered before. These interruptions can be time-consuming and disrupt concentration and work in progress.

There's no way to eliminate all these interruptions, but another article I found gave ways to minimize them. Setting regular times to be available, as well as times not to be available, is a good technique, but could prove useless if those times are not made known and could also prove difficult with a large portion of the faculty. People, especially new staff, should be advised to save up their non-urgent matters so they can be gone over at one time, instead of dealing with them piecemeal. Also, learning to politely say, "Now is not a good time" can go a long way, but this should be accompanied by a time they can come back. It is also important to get right back to the task at hand to minimize the impact of an interruption (Peckham, 2001).

One article described a time management tool called "waste disposal". This involved identifying and eliminating our wasted time, the most common source of "waste" being social, such as non-urgent telephone calls from friends or family or extended socializing with coworkers (Blair, n.d.). In these instances, the "Now is not a good time" technique can work again with non-urgent telephone calls from family, and not suggesting to friends that they can call you at work may prevent some of these phone calls. Extra effort may be needed, though, to curb the urge to idly chat with other colleagues whom you run into, and to cut down the amount of time you spend "talking shop" after meetings. It is especially difficult to turn away from conversations when others, or even you, are frustrated or upset and need to talk, vent, or complain.

Delegating Tasks

Another suggested time management tool involved delegating minor or routine tasks to subordinates (Blair, n.d.). Research administrators tend to spend a lot of time doing what should be a subordinate's work or the work of others, as we often feel it is easier and faster to do the job ourselves. This comes into play especially when we are training new staff, which can be a very time-consuming and frustrating job. It can take two to three times longer for a new staff member to complete a task than if we did it ourselves, not including the additional time we need to review and correct their work.

We don't always realize that constantly helping others with their work can have a major impact

on our own work. When training subordinates to do minor tasks, we need to make sure that directions given to them are clear and concise (Blair, n.d.). The important thing to remember when training new staff is to exercise patience, realizing that eventually they will be able to complete the tasks faster, with accuracy and without assistance. In the short term, it may seem to waste more time, but the long-term benefits are what matters in the time management scheme.

The theory of delegating works very well if there are secretaries and subordinates to delegate tasks to. Quite often, research administrators do not have secretaries or assistants of their own, as in my case, and their departments typically suffer from understaffing due to budget constraints. I have found that a good trick, when possible, is to utilize the secretaries and assistants of the faculty whom I am working with at the time to reduce some of the minor tasks that I might otherwise have to do.

Another suggestion is to hire temporary help during large projects or particularly hectic periods. I have done this on occasion when needing help with the preparation and submission of large, multi-institutional consortium grant proposals. The best candidates are former secretaries who have left their positions to work at home and thus require little, if any, training. Grant proposal files can be sent by email, allowing them to edit, format, print, copy, and collate the necessary paperwork and drop it off when they're done. Because of the short time periods, this expense is small and more easily budgeted for.

TIME MANAGEMENT AT HOME

When I returned to school to finish my degree, I had to make some changes in my personal life in order to accommodate the hours at school, the longer work hours, the work I was taking home, and my homework. Since my children were home all afternoon after school, I taught them how to cook dinner and do laundry, and delegated daily household chores to them, such as doing the dishes and feeding and walking the dog. I hired someone to do the major housecleaning every two weeks.

Since I needed more time at home for homework, I limited the work I took home to printed publications and grant proposal drafts that I needed to read and edit. I found that this kind of work could be done curled up in a comfortable chair or in bed at night after I finished any homework, so I could still relax, unwind, and clear my mind of the day's events. I've found that doing the reading and editing at home instead of at work frees up more time during the workday for tasks that can't be done at home, gets me out of the office a little earlier, and allows me to concentrate on the task with little interruption.

I also avoid staying up too late at night, so I am not tired the next day. One of the top five management mistakes I found was not getting enough sleep, and studies have shown that nearly 75 percent of people complain on a regular basis that they are "flat-out tired" (Whetmore, 2001).

Another top five management mistake was to be out of balance with the seven vital areas of life: health, family, financial, intellectual, social, professional, and spiritual. We eventually self-sabotage our success if we neglect any one or more of these areas (Whetmore, 2001). I felt that I kept a fairly good balance in these areas, but it is something that I continually monitor and reevaluate. In our field, it is too easy to lose balance and have work become an overriding priority, where it can quickly consume what should be our personal and family time.

CONCLUSION

I have survived fairly well in the research administration environment since I brought a few basic time management techniques to my job. However, I often still feel overwhelmed, wondering where my day went, and as though I hadn't gotten anything done I wanted to do. But my goal, and the goal of all research administrators, is to do more than cope and survive, so we need to continue to learn and adopt new techniques and tricks. Adding new techniques I come across to the ones I already practice should help me free up more time during my workday, which I can use to keep abreast of the myriad of continuous policy and procedural changes happening in the university and in the research community.

As a whole, the research community is undergoing many technological changes that are affecting the way research is funded, the administration of awards, financial reporting, and research compliance. More attention is being paid to conflicts of interest when new technologies from research yield patents, and faculty initiate licenses with corporations or start their own businesses. As research administrators, it is an important part of our job to be aware of, understand, and be able to implement these changes so as to help our faculty avoid non-compliance issues that could be detrimental to our institutions.

The role of the research administrator will not become easier over time, and there will always be the hectic days, the impossible deadlines, and the occasional feeling of being overwhelmed. The use of time management techniques, and the search for and sharing of new techniques and practices can help reduce some of this and restore some control to the workday. The most important technique to practice, which has nothing to do with time management, is to remember why we are research administrators. The underlying mission of our work is to help better our community, society, and world. I've found that reminding myself of our mission during stressful times is a wonderful motivator to get me through those days.

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Shelley Hesselton-Mangan started at the University of Massachusetts Medical School as a Grant Accountant in the Department of Financial Services. She became Research Staff Accountant for the Department of Medicine and is now the Research Administrator for the Department of Surgery. In May 2003, she will receive a BBA in Accounting from Assumption College in Worcester, Massachusetts and will continue towards an MBA and then a Ph.D. in Economics and Public Policy. She holds an Associate's degree in Science, Environmental Engineering, from Springfield Technical Community College in Springfield, Massachusetts and is a member of the Alpha Sigma Lambda National Honor Society and the National Dean's List.

Best—and Worst—Practices in Research Administration

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ABSTRACT

This article discusses some of the best—and worst—practices in research administration. This discussion is based on a review of the literature and our cumulative 70 years of experience in establishing, administering, training, evaluating, and mentoring research administration programs and professionals in public and private universities. In essence, four main factors differentiate the best from the worst: (1) Culture; (2) Change; (3) Competence; and (4) Communication.

Traditional emphasis on “best practices” has focused on the competence or skills necessary to be an effective research administrator. This article takes a broader perspective, placing competence in a larger framework of organizational behavior that includes the attributes of culture, change, and communication. Mishandled, any one of these factors can hamper an institution’s research and scholarship initiatives. Conversely, when handled skillfully, research administrators are extremely effective and experience high job satisfaction as judged by themselves and their professional colleagues.

CULTURE

What is your institutional culture for research and scholarly activities? Would **you** want to do research at your institution?

Research, of course, does not exist in a vacuum. It is conducted in the context of an institution’s culture. While a full discussion of academic cultures is beyond the scope of this article, certain

institutional behaviors, when taken collectively, can contribute to a positive research culture. Wagner and Hollenbeck (1995) note that organizational culture grows out of informal, unofficial ways of doing things. It influences the formal organization by shaping the way members perceive and react to formally defined jobs and structural arrangements.

Since some institutions are more conducive to supporting research than others, how do you recognize a supportive culture? Unfortunately, a psychometric test of one's institutional culture does not exist; the concept is abstract. Instead, one looks for certain institutional behaviors that, when occurring together, represent a positive research culture. At least three specific institutional behaviors operationally define the research culture: hiring practices, administrative financial commitment, and enforced reward systems. Each institutional behavior is discussed below.

Hiring Practices

The faculty members you hire today will affect the level of extramural funding you will secure several years later. In this sense, an institution's hiring practices reveal how it is planning for the future. When looking at the hiring process used by institutions to recruit new researchers, two pivotal points deserve special attention—the job description and the interview process. Those institutions following “best practices” include the expectation of research in typical job vacancy announcements as appropriate to the institutional mission.

A recent review of the *Chronicle of Higher Education* (January 2003) revealed position openings for predominantly graduate institutions seeking to hire an assistant professor of chemistry. The key research expectation sentence in five different university job descriptions included the following:

- “Successful applicants will be expected to develop nationally recognized and funded research programs.”
- “The successful candidate will be expected to develop a vigorous research program.”
- “The successful candidate will be expected to establish a productive research program that involves undergraduate and master's students in experimental analytical and/or physical chemistry.”
- “Applicants with research interests that complement our strengths in the areas of biosciences, materials chemistry or environmental sciences are particularly encouraged to apply.”
- “The successful candidate must establish an externally funded, independent research program in organic materials chemistry with an emphasis on synthesis, that overlaps with existing departmental research programs. Research must involve both graduate and undergraduate students.”

The language of such job vacancy announcements communicates the *a priori* expectation that scholarly productivity is a part of one's job description.

Beyond the job description, to what extent is the expectation of scholarly research emphasized in the actual interview process? Do the deans, department chair, and faculty members communicate the expectation of scholarly research during interviews? Do interview questions probe past track records and future potentials for research? Are evaluation forms used so interviewers can record

their impressions about potential research productivity? Do those forms request specific comment about research potential?

Institutions skilled in interviewing researchers have developed questions designed to elicit specific behavioral responses about past, present, and future performance. In essence, the interview questions assess performance as a predictor of competence. Examples of competency-based interview questions can be found in human relations reference texts and on the Web. The Government of Alberta (2001) presents 36 specific questions that are distributed among 13 different categories and can be adapted easily to interviews with researchers. While these are relevant and probing questions, they ignore one important category of behavior, i.e., negative information (Green, 1991). For instance, the interview should probe instances where candidates failed in a project, got into a situation they could not handle, or did not know the proper procedures or guidelines. How did they handle the situation? Unwillingness to acknowledge past failures, which we all have, speaks volumes about the candidate's forthrightness and even ethical standards.

In addition to exploring the candidate's research capacity, it is important for interviewers to communicate the institutional policies and procedures—the culture—that supports research. This would include such things as promotion-and-tenure policies at all levels, e.g., departmental, dean, and central administration. Indirect cost return policies should be explained. Sabbatical support and internal seed grant programs are of special interest to most candidates. Further, the support services offered by the grants office should be detailed, e.g., assistance in planning proposals, editing drafts, building budgets, handling compliance issues, and expediting internal approvals and agency submissions.

Although hiring protocols are primarily handled at the departmental or dean's level, job vacancy announcements should include expectations of scholarly productivity and grantseeking, when appropriate. Grants offices can develop sample language to be included in future job vacancy announcements regarding the expectation of scholarly productivity. Further, the chief academic officer could issue a memo urging the inclusion of scholarly productivity language in future job vacancy announcements.

Among the "worst practices" we have seen at some institutions:

- Unclear or non-existent policies, especially as regards the relationship between teaching and research responsibilities at comprehensive universities.
- No written expectation of research performance in job descriptions, or, at best, a "lukewarm" statement that "candidates are expected to engage in scholarly research."
- No written statement from a member of central administration regarding the role of research, including interdisciplinary research, in the overall institutional context.
- No proactive attempt by interview committees to solicit and collate written feedback from interviewers.

Administrative Financial Commitments

Money can be a powerful faculty motivator to engage in grantseeking. Most institutions have internal mechanisms in place to provide seed funding for faculty projects, principally so they can acquire pilot data for extramural funding. Funding usually comes from various internal budgets.

Beyond internal seed grant programs, some institutions return a percentage of the indirect costs back to stimulate further research efforts. These funds flow variously to deans, department chairs, center directors, or faculty researchers. The percentage of funds returned fluctuates from 0–50% or more among institutions. Most research administrators agree that these funds do serve as a positive reinforcer of faculty research activity as well as stimulating additional extramural grantseeking.

Beyond the internal seed funding and the return of a percentage of indirect costs, some institutions also return a portion of the salary savings generated from academic year grant salary funding. However, many external grants do not include academic year salary; as a consequence, few salary savings dollars are available to support further research activities. For instance, assume that a faculty member receives \$10,000 in academic year salary from a grant and “buys-out” of teaching one course. It is likely that a temporary replacement could be found for, say, \$3,000 to teach a course. The resulting salary savings of \$7,000 can be returned to the researcher’s academic department to be used for further research stimulation purposes.

Among the “worst practices” we have seen at some institutions:

- Some institutions lack an indirect cost return policy.
- Some institutions with indirect cost return policies direct most of the funds to various administrators, which may or may not end up accessible to the faculty who initially generated those funds—a disincentive to grantseeking.
- Some institutions have a sabbatical policy, often granted once every seven years as a matter of entitlement. The sabbatical application process may not encourage the intellectual rejuvenation that comes from learning a new research technique, collaborating with a colleague, generating pilot data for future proposals, or visiting with program officers.

Enforced Reward Systems

Institutions with strong research cultures have multiple reward systems in place to reinforce the desired faculty behavior of grantseeking. Despite occasional faculty claims to the contrary, **non-financial** reward recognitions often play a crucial role in motivating faculty grantseeking activities.

The faculty members need a clear and consistent view of the role of grantseeking in both annual evaluations and promotion-and-tenure deliberations. The academic deans also need a clear vision but such administrative perspectives often vary among colleges. A gap sometimes exists between faculty and dean perceptions regarding the extent to which grantseeking “counts” in promotion-and-tenure deliberations, or annual evaluations. This gap can be so substantial as to be a constant source of tension between faculty and administrators.

The faculty and deans often express varying opinions concerning the desirability of providing released time or “course buyouts” as a result of successful grantseeking. Some academics feel that given their traditional mission and history as a teacher training institution, anything less than full-time professional educators in the classroom would shortchange student learning. Further, some faculty specializations are so unique that one could not reasonably expect to find competent replacements in the area.

In contrast, some academic administrators suggest that as a part of the transition from a “college” to a full-fledged “university,” an increased emphasis on faculty scholarship is obligatory. These individuals see the lack of clear “buyout” policies as a barrier to future grantseeking.

To help raise the institutional profile of a “university,” grants offices can help publicize campus research accomplishments, both through internal newsletters and emails, and externally, through press releases to print and electronic media. Among other things, these activities provide important recognition for faculty grantseeking efforts.

Among the “worst practices” we have seen at some institutions:

- The role of research and scholarly productivity in annual evaluations and promotion-and-tenure considerations is unclear at departmental and college levels.
- Perceptions may exist that only getting grants will “count” towards career advancement; applying for grants does not “count.”
- Publications are the most important consideration in career advancement, not grantseeking.
- Only individual research grants “count,” not training grants or departmental-focused curriculum grants.

At some institutions, teaching may become such a priority that emphasis on research and publications become a negative. To some individuals, the thought of not teaching as a result of a course “buy-out” may be perceived as a double negative.

CHANGE

Research administrators spend much of their time encouraging more proposal submissions, strengthening the institutional research culture, securing administrative and faculty buy-in to research and scholarly activities, and training personnel about research policies and procedures. These activities represent change among research administrators and faculty alike. While research administrators can be change agents at many institutions, seldom have they reflected on the nature of change. Not everyone is enamored with it. Why do people resist change?

Here are some common forms of resistance to change:

1. **Self-interest**—change may make it difficult or impossible to satisfy personal needs and desires at work. *“I was hired to teach, not do research.”*
2. **Fear of the unknown**—not knowing or lacking a basis to predict the outcomes of change can create an atmosphere of fear. *“What’s in it for me?”*
3. **General mistrust**—lack of confidence in leadership, not understanding the need for change, and feelings that past performance is being questioned undermine confidence that change is good or even needed. *“My workload is already too heavy and now they want me to do more; why should I?”*
4. **Fear of failure**—change means altering the way people do their jobs; change creates discomfort and concerns about meeting new demands. *“Don’t talk to me about grants. I tried it once and struck out—a total waste of time.”*
5. **Bureaucratic inertia**—stemming from rigid rules and standardized procedures, bureaucracy fosters lack of initiative and flexibility. Organizations must be certain they have the autonomy and resources to affect change before it is initiated. *“Sure, I’ll write a grant just as soon as they*

give me some released time and a good graduate student.”

By definition, organizational change or restructuring is a planned approach to comprehensive, long-term modifications under the guidance of change agents. Five important features characterize organizations that are effective in implementing institutional change.

1. *Emphasis on planned change* evolves out of a compelling need for change and the emphasis is on *planning*. Two major factors usually trigger institutional change. One is a growing financial imbalance in operations. Departmental and institutional needs outstrip available internal budgets. The second is a desire to create a new mission and vision that would impact research and scholarly activities. Both call for a change in management structures and resources. Central administration must constantly review its planning strategies to ensure that change is indeed occurring, and in the directions intended.
2. The *social-psychological focus* of change is a second feature. The impact of change occurs at many levels: individual, interpersonal, departmental, interdepartmental, and university-wide. More specifically, this would include faculty, chairs, deans, central administrators, students, post-docs and any other entity with whom the institution interacts. In other words, change agents must anticipate and plan for the far-reaching effects of change.
3. *Attention to comprehensive change* is a third feature. This feature is linked to the previous one, but also has other implications. Since change is designed to improve operational efficiencies, strengthen research capacity, and improve the institutional research reputation in a competitive marketplace, the new changes must reach the attention of *all* individuals associated with the university. Typically, the changes are carefully introduced and explained to the faculty and administrators. Other supportive personnel, such as secretaries, laboratory technicians, and graduate students, are left unaware of the changes taking place. Systematic methods and programs must be developed and presented repeatedly to ensure that key personnel at all levels are involved.
4. *Long-range orientation* is a fourth vital feature. Animal and human research has produced a behavioral axiom that says, “*Organization prevents reorganization.*” Grandma said it more simply: “*It’s hard to teach an old dog new tricks.*” These observations tell us that natural resistance makes it difficult to initiate change. It is even more difficult to maintain change and it takes months, even years, before the desired results are achieved. In essence, institutions must make a long-term commitment to implementing change.
5. *Guidance by change agents* is the fifth feature and it is linked to long-range planning strategies. Effective change agents may be external or internal to the university. There are advantages and disadvantages to both. External agents are new, objective, and have no biases, but also lack knowledge of the culture of the organization and experience in working within it. Internal agents have the knowledge and experience, but may also be biased and bring the types of resistance to change that are inherent to all universities.

In essence, institutions must be aware that in addition to the financial challenges for increased grantseeking, several “natural” and powerful forces are at work that could undermine the long-

range success of a new or expanded emphasis on research and scholarly productivity. The development of a strong core of internal change agents and planned strategies for monitoring change and validating its occurrence is vital. Academic units at all levels should discuss the phenomenon of change.

Among the “worst practices” we have seen at some institutions:

- Change is imposed “top-down” with little input or “buy-in” from the researcher community.
- Change agents fail to understand the process of inducing long-term change.
- Change is not communicated clearly at all levels in the research community.

COMPETENCE

Research administrators strive for competence. This consists of a bundle of behaviors that collectively cause others to pass judgments about degrees of competence. In their quest for competence, they seek out “best practices” in national associations (Bogdanski, Turner, & Barnard, 2002; Engineering Research Council, 2002) and on university research administration Web sites (Arizona State University, 2002). “How to” books (Miner et al., 2003) are a compendium of “best practices” in successful grantseeking.

Personnel in grants offices may gather information about grant opportunities, disseminate information, help researchers plan and develop proposals, draft budgets, publish and distribute proposals, and resolve regulatory compliance issues. Most research faculty value these activities and behaviors. Researchers would agree that the grants office staff was competent if these behaviors were displayed consistently and accurately in a timely manner.

The highly competent research administrators will go beyond these basic office services and provide early access to inside information. For example, most biomedical researchers know that the Whitaker Foundation is intentionally going out of business; by 2005, all assets, principal, and interest alike will have been awarded. The industrious research administrator will go one step further and through probing learn that another new sponsor will be coming on the philanthropic scene in a few years to replace the void left by the departure of the Whitaker Foundation. Based on this reconnaissance information, the research administrator would help biomedical faculty develop new relationships with a future major benefactor.

Among the “worst practices” we have seen at some institutions:

- A program officer refused to conduct an obligatory site visit if it meant interacting with a particular research administrator. To make matters worse, the faculty won’t share the concerns that the sponsor has regarding this one research administrator; as a result, the problem goes uncorrected.
- A corporate official refuses to discuss R&D contract terms with a research administrator who has failed to establish professional competence. Without credibility, the institutional research infrastructure slowly weakens and, over time, award dollars decline.
- A research administrator suffers from a severe case of “compliance-itis.” Office energies are directed towards ensuring compliance with regulatory agency requirements at the expense of failing to see the “big picture,” ways in which a current situation can be

- leveraged to the advantage of the researcher.
- A research administrator suffers from a severe case of “passive-itis.” The office role is one of providing passive library services. This type of office, for example, helps faculty members fill out a PHS 398 form or submit an NSF proposal via FastLane. This office would not be able to engage in proactive faculty support services like facilitating **pre-proposal** contacts, assisting in proposal-writing activities like document design or boilerplate descriptions, or drafting budget narratives.

COMMUNICATIONS

According to organizational behavior research (Sawyer, personal communication, 2003), organizational communication is a complex phenomenon. To simplify the complexity for purposes of this paper, three major variables affect the information flow within an institution and its various academic units: colleges, departments, centers, and institutes. They are:

1. **Who** has the knowledge?
2. **Where** is the knowledge?
3. **What** is the knowledge?

Sawyer further says that information tends to flow fairly easily into the central database (human or electronic) but it does not “naturally” flow out. Put differently, in academia, information flows more readily on an inward and upward basis than an outward and downward basis. In fact, some organizations dispense information to its constituents on a “need to know” basis. Constituents, in turn, also go to the central database on a “need to know” basis that meets their immediate individual needs. They do not naturally review all of the existing information on a regular, periodic basis.

Knowing **who** has knowledge is the most important factor in establishing networking among individuals for the purpose of exchanging meaningful grant information. Successful research administrators are network masters; they know who has the latest information about such things as program priorities, review panel composition, reasonable budget size, subcontract negotiations, and compliance requirements. Internally, research administrators know how to get seed funding and extra graduate student tuition credits, and influence crucial research policies such as promotion-and-tenure criteria.

Where knowledge resides is second in importance and is often influenced by **who**. Administrators often possess knowledge but keep it in their office. Individual faculty members possess knowledge but are often reluctant to share it. They feel it is to their advantage to keep knowledge secret, particularly in a competitive environment. Sometimes **who** is outside the institution but communicates with someone internally. No one else, however, ever knows of this external-internal communication channel. Again, individual reluctance prevents the sharing of information; breaking down this barrier often requires a clear, centralized location and process for doing so.

What is third in importance, although it can change rapidly, sometimes on an hourly basis. Consequently, it is a major challenge to maintain a current **what** component in a central database. **Who** and **where**, on the other hand, are more stable and should receive greater emphasis in a highly centralized management system.

A primary organizational problem area in many institutions is the lack of expedient and regular communication among faculty, between faculty and administrators, and among administrators. Researchers consistently express a strong desire for centralization of knowledge and assistance in all facets of grantseeking and proposal preparation. Further, most faculty agree that the repository for this central core should be located in the grants office. The Director and staff are ready and willing to take on this responsibility. While a grants office can become a central repository for the inward flow of grant information, they also have a commitment to expedite the outward flow of information.

Successful grant offices have taken aggressive steps towards standardized procedures for identifying funding sources, pre-proposal reviews of potential grants, supporting the preparation and writing processes, providing ancillary support to the grant author for actions and documentation required to complete the proposal, and steps toward submitting the proposal for final administrative approval.

Among the “worst practices” we have seen at some institutions:

- Announcements about new grant opportunities are disseminated to faculty after the deadlines.
- Announcements about new grant opportunities are disseminated to deans and chairs who may or may not forward them to appropriate faculty.
- Announcements about new grant opportunities are not presented in a concise, skimmable fashion; block copying, for example, an NSF grant announcement or including a web address are not sufficient conditions for satisfying the information needs of faculty.

CONCLUSION

Research administrators can be an active force in turning institutional negatives into positives. Moreover, if research administrators understand the dynamics of change, develop professional competence, and communicate skillfully to various constituencies, they can strongly influence the research culture at their institutions. All administrators would be well advised to understand how the overall culture of the institutions is managed and where research fits within that culture.

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Assessing the Needs of a Changing Faculty

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ABSTRACT

In his seminal book, *Scholarship Reconsidered*, Ernest L. Boyer recommends that faculty members pursue their research interests in order to better inform their teaching. The Office of Sponsored Programs at California State University, Chico conducted an assessment of the perception of research at a predominantly undergraduate institution where teaching is the university's primary mission. There is a gap in the view of the role of research among, on the one hand, college deans and new faculty who view seeking and obtaining external funding to support research interests as a positive pursuit and, on the other hand, department chairs who view it negatively. This is an important finding considering the power that department chairs wield as the primary gatekeepers of the tenure process for new faculty. This paper explores the views of college deans, department chairs, and new tenure-track faculty on the role of externally funded research on the retention, tenure and promotion process.

INTRODUCTION

In 1990, Ernest L. Boyer authored *Scholarship Reconsidered: Priorities of the Professoriate*. In this book, Boyer describes the historical phases of the development of the American professoriate that resulted in the triad by which faculty members are evaluated for retention, tenure and promotion (RTP): research, teaching, and service. Boyer proposes abandoning the paradigm of research-versus-teaching for an alternative paradigm of the teacher-as-scholar. Boyer suggests that "teaching, at its best, means not only transmitting knowledge, but transforming and extending it as well" (p. 77). He also emphasizes that, "We need scholars who not only skillfully explore the frontiers of knowledge, but also integrate ideas, connect thought to action, and inspire students" (p. 77). To summarize, Boyer argues that: (1) research, synthesis, practice, and teaching are inseparable; and (2) faculty need to shift their orientation from research-versus-teaching to research-informing-teaching. The leadership of California State University (CSU), Chico supports Boyer's concept of research informing-teaching. In a memorandum to the Academic Affairs Council in the summer of 2001, the provost of CSU, Chico described the importance of the teacher-scholar model in this way: "All of the academic deans have responsibility for working to help new faculty succeed and to provide the resources and support

the new faculty need to create high-quality learning environments. The first step in this process will be an orientation for new faculty to the university, which will include clarification of the RTP [Retention, Tenure, and Promotion] expectations, and what it means to be a teacher-scholar at CSUC.”

In the same memorandum, the provost also directed the Office of Sponsored Programs to: “Assess the needs of a changing faculty, and develop a plan for Sponsored Programs to meet those needs.” Undertaking this assessment in the fall of 2001 provided the Office of Sponsored Programs with an excellent opportunity to revisit the relationship between teaching and research, especially since the university hired 40 new tenure-track faculty a year between 1998 and 2001—about 30% of all faculty. This was the largest number of new tenure-track faculty hired in such a short period of time since the early 1970s.

It was believed that the opportunity to determine the extent to which college deans, department chairs, and new faculty understood the concept of teacher-scholars could influence the role of sponsored programs in terms of research on the future direction of the university culture. It was also hoped that information from this assessment would determine the direction and magnitude of sponsored program endeavors undertaken by faculty at the university for the foreseeable future. Instead, a gap was discovered the college deans’ and new faculty’s view of research as positively influencing teaching and most department chairs’ belief that research gets in the way of teaching. Another interesting discovery is that although most department chairs do not encourage their faculty to seek and obtain grants and contracts, a few are hiring new faculty with the explicit expectation that they will pursue and obtain external grants to support their research interests as prescribed by Boyer. While there may not be university-wide acceptance of Boyer’s teacher-scholar model among all department chairs, some are introducing this concept into the culture.

REVIEW OF THE LITERATURE ON BOYER’S MODEL AND ITS INFLUENCE VIS-À-VIS TEACHING

The introduction of Boyer’s teacher-scholar model in the 1990s led to a plethora of research in the academic community to determine whether a relationship exists between scholarly pursuits and teaching effectiveness. In general, the literature suggests that research is thought to be significantly beneficial to the teaching effectiveness of teaching-oriented faculty (Brew, 1999; Centra, 1983; Neumann, 1992). The majority of research conducted from 1983–1999 demonstrated positive correlations linking research productivity and teaching (Aleamoni, 1987; Brew, 1999; Centra, 1983; Feldman, 1987; Hattie & Marsh, 1996; Marsh & Dunkin, 1992; Terinzini & Pascarella, 1994; Wachtel, 1998). The research literature also reports that the connection between teaching and research is valuable to student learning (Colbeck, 1998; Jenkins, 2000). Researchers model in their own work the learning approaches that are desirable for students to emulate (Brew & Boud, 1995). Chief academic officers’ perceptions of scholarship significantly affect the academic climate; they communicate with and mentor faculty about the relationship between research and teaching (Harvey, Leslie, et al., 1998). The common belief among chief academic officers is that teaching and research are positively correlated. Hattie and Marsh (1996) mention 10 studies that found that the majority of chief academic officers polled claimed that an active research interest is essential if a person is to be a good university teacher.

A total of 181 faculty were surveyed about their attitudes toward involvement in grant-related

activities at Bradley University in Illinois, a predominantly undergraduate institution similar to CSU, Chico. Study results showed that faculty believe that engaging in research/creative production is essential to their professional development (91.2%); that their research activities enhance the quality of their instruction (81.2%); and that they cannot achieve excellence in teaching (65.6%) or remain current in their discipline without such involvement (64.4%). Over 50% wanted more resources to assist them in all aspects of the grant process (Sterner, 1999). Gottlieb and Keith (1997) found that research positively impacts teaching, but attributes of teaching (e.g., course load, student demand, etc.) negatively impact research.

Three studies directly examining students' views of the teacher-scholar model found that students who are motivated to study perceive clear benefits of faculty involvement in research (Neumann, 1994); students are often ignorant of the research their teachers are doing yet would like to know more (Jenkins et al., 1998); and students' perceptions of the relationship between teaching and research are driven by whether research is presented to them as an objective product or a process of inquiry, and whether teaching is seen as a transmission of what is known or an exploration of what is not known (Brew, 1999). Brew argues that, "If researchers recognize the ways in which their activities parallel those of students and take steps to involve students in research-like activities, research can inform practice in facilitating learning" (p. 298).

In summary, three broad generalizations can be culled from a review of the literature on the impact of Boyer's teacher-scholar model on teaching at predominantly undergraduate institutions where teaching is the primary mission. First, there is widespread belief among faculty and chief academic officers that teaching and research are positively correlated. Second, while research positively impacts teaching, the attributes of teaching (e.g., course load, student demand, etc.) negatively impact research. Third, faculty can motivate students to learn more through class discussions of their research pursuits as well as by involving students in their research activities.

REVIEW OF PRIOR ASSESSMENTS OF FACULTY NEEDS AT CSU, CHICO

This is not the first time that the issue of the teacher-scholar model has been investigated at CSU, Chico. In 1994, Jeff Wright, Director of the Office of Sponsored Programs, chaired a local reaccreditation committee that investigated those factors at the university that promote faculty efforts to remain active and current in their fields of expertise. The committee report summarized findings from a 1994 faculty survey (236 respondents) and compared those findings to a similar survey conducted five years earlier (245 respondents). In both surveys, one half of the faculty indicated significant dissatisfaction with the level of university support for their professional development. On average, faculty responded that they wanted more time for research and creative activities. Of the choices offered, the only area of increased time for the "ideal mix" was related to professional development. They proposed offsetting this increase by spending less time on classroom instruction and university service.

The 1994 report pointed out that the notion of the teacher-scholar serves as a national standard for comprehensive universities like CSU, Chico and went on to note that better achievement of the "scholar" portion requires both an understanding of its role and more support for faculty to pursue scholarship. The report concluded that a commitment of resources and expectations must be made to ensure that a balanced teacher-scholar model prevails and concluded that: "As an institution, we have yet to achieve the balance needed"(p. 2).

CURRENT ASSESSMENT OF FACULTY NEEDS AT CSU, CHICO

The Office of Sponsored Programs conducted its most recent assessment of faculty needs during the 2001–2002 academic year. This assessment surveyed the perception of the teacher-scholar model among college deans, department chairs, and new tenure-track faculty at CSU, Chico. One of the conclusions drawn from this assessment is that a paradigm shift is occurring among faculty from the “old guard” who did not expect to pursue scholarship in order to attain tenure to the “new guard” who do expect to do so. The results of this assessment further suggest that the support from university leadership for Boyer’s teacher-scholar model at CSU, Chico kindled a resurgence in the pursuit of scholarship to fulfill the “scholar” portion of the model at the same time that new tenure-track faculty began to arrive at CSU, Chico with their own expectation of pursuing scholarly activity.

Although grants and contracts do not by any means account for all faculty scholarly activity, they may be used as a barometer of the direction and magnitude of faculty scholarly pursuits generally. During FY1993–1994 the total dollar volume for all awards received was almost \$15 million. During FY2000–2001, the total dollar volume doubled to almost \$30 million. It would be very difficult to determine statistically the extent to which this increase is attributable to support from university leadership and new tenure-track faculty of Boyer’s teacher-scholar model. In fact, one could plausibly argue that the increase may simply be due to the boost in the number of new tenure-track faculty. On the other hand, one may also argue that the data are highly suggestive of a positive link between the two. That is, the combination of support for Boyer’s teacher-scholar model between university leadership and new tenure-track faculty may be having a synergistic effect on the increased volume of grants and contracts.

With the above observations in mind, data from three different sources are described below. The first is a review of recent trends of faculty use of the Office of Sponsored Programs’ services from 1998–2002. The second is a survey of new faculty conducted by the Office of Academic Affairs during the 2002 spring semester. The third is an assessment survey of new faculty needs conducted by the Office of Sponsored Programs over the course of the 2001–2002 academic year.

Recent Faculty Trends in Grants and Contracts

The Office of Sponsored Programs provides a number of opportunities to assist CSU, Chico faculty to obtain internal and external grants and contracts to support their scholarly and creative pursuits. The Office makes available to all faculty internal research grant competitions worth approximately \$225,000 each year. From 1998–2001, faculty from all ranks submitted 374 proposals worth a combined value of \$675,000. Of the proposals submitted, 46% were submitted by new tenure-track faculty (173). Of the 174 grants awarded, 51% were awarded to new tenure-track faculty (89).

Internal grant activity is considered an important indicator of the interest and perceived needs of faculty for professional development in the area of scholarly and creative activities. It is assumed that these internal opportunities help faculty to build a track record leading to presentations at professional meetings, publications in refereed journals, and greater potential for seeking and obtaining external research funding opportunities. All of these activities are also considered important in their retention, tenure, and promotion (RTP) process.

Data at CSU, Chico concerning externally funded research and contract activity from 1990–2001 show that the number of funded projects grew by 86% although the campus itself was still recovering from a period of downsizing due to the economic recession of the early 1990s. The total value of the contracts and grants also grew by almost two and one half times.

Data at CSU, Chico also show that most external funding does not support traditional research. Of the 202 projects started in 1990, only 51 were classified as traditional research and most of these were considered applied research projects. Eleven years later the number of research projects had grown to 82, but as a percentage of total projects there was a reduction from 25% to 21%. Further, the number of faculty with any type of award grew from 68 to 90.

Academic Affairs Survey New Tenure-Track Faculty

The issue of fostering the teacher-scholar model is at an historic crossroads at CSU, Chico. As mentioned earlier, since 1998 approximately 40 new tenure-track professors have been hired annually to replace retiring senior professors. Clearly there exists the potential to change the culture of teaching and scholarship that was established by a highly stable faculty who were hired primarily between the mid-1960s and early 1970s. While this retiring cohort's level of scholarly and creative activities was higher than their predecessors' when CSU, Chico was a Teachers College, the newest cohort's level is expected to go even further. An example of the changing culture is the growth in the role of the Office of Sponsored Programs. In 1972, the Office of Sponsored Programs managed about \$500,000 in grants and contracts. Thirty years later this has grown by a factor of 60 to about \$30 million annually. Furthermore, if the teacher-scholar model is to be better balanced with greater emphasis on the scholar portion, addressing workload issues early in a new professor's career might lead to potential long-term opportunities for obtaining externally funded release time from classroom instruction. (Note that faculty at CSU, Chico teach four courses per semester.) In a study of tenure-track faculty hired since 1999, the CSU, Chico Office of Academic Affairs surveyed two samples from this cohort in the spring semester of 2002. The first group consisted of 31 first-year tenure-track faculty. The second consisted of a combination of 45 second/third-year tenure-track faculty. Included in the survey were questions on various aspects of their experiences as they related to the teacher-scholar model at CSU, Chico. The following summary of study results suggests that after a positive first year, perceptions about workload as related to professional development move in a negative direction. Perhaps most significant is the fact that 60% of faculty in their second and third year do not believe there is time for research and sponsored programs workshops, which are designed to enhance research activities.

- Getting Tenure: 74% of first-year and 62% of second/third-year faculty agree that they understand what they need to do to get tenure. However, 29% of the latter group disagree.
- Importance of Teaching: 72% of first-year and 48% of second/third-year faculty agree that their departments consider teaching most important. However, 25% of the latter group disagree.
- Adequate Resources: While 59% of first-year faculty agree that they have adequate support for travel, equipment, and supplies, 44% of second/third-year faculty disagree.
- Professional Development: While 65% of first-year faculty agree that they have adequate support for professional development, less than half—48%—of second/third-year faculty agree and 36% disagree.
- Time for Research: Only 20% to 30% of both groups agree that they have time for

research and sponsored programs workshops while almost 50% of first-year faculty and 60% of second/third-year faculty disagree.

- Importance of Research at Departmental Level: Only about 10% of first-year faculty and 40% of second/third-year faculty agree that externally funded research counts heavily in their departments.
- Importance of Research at University Level: Finally, more than 50% of first-year faculty and 60% of second/third-year faculty agree that externally funded research counts heavily at the university level.

Assessment Survey: A Comparison of Deans, Chairs, and New Faculty

During the 2001–2002 academic year, the Office of Sponsored Programs conducted its comparative study of the opinions of college deans, department chairs, and new faculty hired between 1998 and 2000. The survey was designed to elicit their views on the relationship among teaching, scholarship, and external funding. A survey instrument was filled out by all seven college deans, 31 out of 36 department chairs (86%), and 64 out of approximately 110 new tenure-track faculty (58%). Half of the 64 new faculty participating in the study completed the survey instrument in one-on-one interviews. The other 32 filled it out during “Group System” sessions—a computer-based process that allows participants to collaborate anonymously in real time to address these issues. Three groups of new faculty were invited to three different sessions: faculty who are (1) already highly engaged in grants and contracts; (2) moderately engaged; and (3) not engaged.

The Office of Sponsored Programs wanted to determine attitudes about the role of external funding in support of research and creative activities, including release time from classroom instruction. This comparative study focused on three aspects of external funding: (1) level of encouragement to apply; (2) perceived benefits or value; and (3) level of expectations for success in seeking and obtaining external support.

Level of Encouragement to Apply

- In terms of applying for external funding, 86% of deans, 81% of chairs and 89% of new faculty agree that their colleges or departments actively encourage professors to apply for external funding to support research and creative activities.
- A large majority of all three groups—86% of deans, 68% of chairs and 84% of new faculty—also agrees that their colleges or departments actively encourage faculty to apply for external funding to enhance their teaching.

Perceived Benefits

- Beyond encouragement to pursue external support, 100% of deans, 68% of chairs and 80% of new faculty agree that external funding promotes professional growth and 100% of deans, 94% of chairs and 60% of new faculty agree that it contributes significantly to success in the tenure and promotion process.

Expectations

- This strong, positive consensus among college deans, department chairs, and new faculty regarding the encouragement and perceived value of external funding begins to decrease when the element of expectations is factored in. That is, 71% of deans, 55% of chairs, and 50% of new faculty agree that hiring committees in their college or department give emphasis to candidates who have the potential to obtain external funding.
- However, this consensus dissipates when specific questions are asked about behavioral expectations. That is, while 71% of college deans and 56% new faculty agree that their colleges or departments expect the majority of the faculty to seek external funding in a two-year period, only 32% of department chairs agree and 48% of the chairs disagree with this proposition.
- In terms of the expectation of a majority of professors obtaining external funding in a five-year period, only 43% of deans and 42% of new faculty agree. But more significantly, 58% of department chairs disagree. This gap suggests that while the majority of department chairs are willing to encourage faculty to pursue external funding in order to support their scholarly activities and even agree that it promotes their professional growth, they don't really expect them to obtain external funding.

Department Chair Feedback

At a provost's meeting of department chairs in January 2003, the findings of this assessment were presented. The department chairs were asked how they would interpret the findings, especially the apparent gap between deans and faculty on the one hand and chairs on the other, in terms of expectations to obtain funding. The following quotes suggest a lack of consensus among department chairs regarding the teacher-scholar model and merits further investigation:

- Chico State is not a research-oriented institution. It's a teaching institution. Our faculty want to teach. That's why they came here instead of research-oriented institutions.
- The difference in the graphs has to do with the fact that the chairs have a more realistic expectation of what faculty do compared to the deans.
- New faculty have to do a lot of course prep work, so they have no time to pursue funding for research.
- Pursuing grants & contracts is different than writing books or articles.
- Research equals money for college deans, not scholarly activity for RTP [Retention, Tenure and Promotion].
- Teaching and research are the most important things new faculty can do to get tenure. Grants and contracts work comes after tenure.
- Chairs do not expect the majority of faculty to seek grants and contracts. The key word is 'majority'—we don't expect the majority to seek and obtain awards. It's a thing some faculty do—a minority of faculty. Some are extremely successful at it—maybe 6 to 10 out of 25 faculty. That's the expectation.

CONCLUSION

This article describes how the Office of Sponsored Programs at California State University, Chico assessed the needs of a changing faculty through the lens of Boyer's framework of research informing teaching. Pinpointing among major stakeholders what it means to be a teacher-scholar

at a predominantly undergraduate institution has the potential to influence the role of scholarship in the university culture for a new generation of teacher-scholars.

In the Office of Sponsored Programs' survey of college deans, department chairs, and new tenure-track faculty, the majority of all three groups agree that their colleges or departments actively encourage professors to obtain external funding to support research, creative activities and teaching, and that the pursuit of external funding promotes professional growth and significantly contributes to success in the tenure and promotion process. There is even strong agreement among the three groups that hiring committees in their colleges and departments give emphasis to candidates who have the potential to obtain external funding.

However, once the focus shifts to behavioral expectations, there is a chasm with college deans and new faculty on the one side and department chairs on the other. This gap reinforces the perception that a paradigm shift may be present in the university culture with respect to the teacher-scholar model. New faculty are arriving on campus with an agenda to pursue their scholarly interests in order to fulfill the scholar portion of the teacher-scholar model. University leadership also espouses the benefits of the teacher-scholar model. But the majority of department chairs—the gatekeepers of the retention, tenure and promotion process and, typically, members of the senior faculty—disagree over the significance of seeking and obtaining external funding as well as whether it is legitimate to equate the pursuit of external funding with doing research. For this group of department chairs, pursuing grants and contracts has nothing to do with research. This gap, in terms of the expectation of pursuing and obtaining external funding to support research, suggests the need for further inquiry among department chairs about what it means to be a teacher-scholar at a comprehensive university like California State University, Chico.

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How Ethics Can Advance High-Tech Linkages Between Universities and Industries

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ABSTRACT

The exponential growth of university-industry research partnerships triggered by the dramatic breakthroughs in biotechnology and information technology in the 1970s, the Bayh-Dole Act of 1980, and the R&D tax credit of 1981 have led to continuing concerns about preserving ethically academic values. Both ethicists and administrators counseled and even predicted caution for the 1990s and beyond. This study encourages research administrators to move forward with these partnerships within the context of basic academic values by developing an ethical framework that will be effective as we face the challenges of the Information Revolution. The ethical framework to deal with the transition from the Industrial to the Information Age in advancing university-industry hi-tech linkages focuses on an enabling context for knowledge creation and transfer through mutual trust or trusted networks, empathetic dialogue, and social responsibility for the public good. This ethical framework will be developed by examining an ethical shift in university-industry relations in the 1990s and early 21st century, overcoming barriers and building bridges, managing conflicts of interest, enabling more effective and efficient commercialization of university technology, and refocusing the vision for the university's role in economic development. Thus, it points to the task of developing concretely targeted systems of applied organizational ethics in solving university-industry problems that arise in these particular areas of collaborative research relationships.

INTRODUCTION

How do university-industry research collaborations serve the public good? This question is the fundamental ethical issue addressed in this paper. It also leads to other questions of basic importance. What obstacles must be overcome for university-industry linkages to engage in collaborative R&D that promotes the public good? How can conflicts of interest be resolved in university-industry partnerships, especially with regard to the universities? How can there be both openness and ownership of intellectual property? What can technology transfer contribute to preparing a well-trained workforce as well as developing high-tech innovations? How can university-industry linkages become an ethically effective and safe means of producing

commercial R&D for economic development and its infrastructure? A number of these questions surfaced in the 1970s and later, triggered by catalysts for the exponential growth of university-industry partnerships.

These catalysts began in 1971 when Intel invented the microprocessor that made the personal computer possible. In 1974 DNA splicing was discovered by Dr. Stanley Cohen of Stanford and Dr. Herbert Boyer of UC-San Francisco, leading to dramatic breakthroughs in biotechnology. Information technology breakthroughs came with the development of ARPANET nodes located at UCLA, the Stanford Research Institute, UC-Santa Barbara, and the University of Utah. These breakthroughs made the biotechnology and information technology revolutions what they have become today. Lastly, and equally important, came the Bayh-Dole Act of 1980, whose effects are still being hotly debated today.

This study on making ethics count in university-industry linkages focuses on the importance of developing a moral framework and value system addressing challenges of the Information Age that enable mutual trust, empathetic dialogue, and social responsibility for the public good. I examine first the rapidly changing circumstances in university-industry linkages that require adapting academic values in biomedicine and related areas to the altered context of the Information Technology Revolution. Second, I deal with the challenges of overcoming barriers and building bridges in university-industry collaboration. Third, I treat the ethical management of conflicts of interest. Fourth, I provide a fresh perspective on the challenging issue of enabling the commercialization of university-industry technology. Fifth, I refocus the vision for the university's role in economic development by putting it in a new ethical framework of practical value for the Information Age.

At least three challenges have continued to undermine university-industry partnerships in the past quarter century, and need a realistically balanced resolution: (1) criticism by industry of risky long-term investments with thorny complications with regard to intellectual property by universities intent on generating revenue; (2) the concern of universities over sacrificing research in the public interest for the benefits of corporate sponsorship; and (3) the national, state, and regional support for these partnerships that undercut the basic commitment of academic values to open communication. Underlying these concerns in regard to university-industry research collaborations is the fundamental issue of skepticism about whether an integration of ethics and economics by both sectors is possible for cooperative social responsibility. Thus, the main aim of this study is to explore how ethics counts in university-industry linkages by putting knowledge creation and technology innovation in a moral framework. This moral framework has a well-defined value system that enables mutual trust and honest dialogue built upon a foundation of caring and sharing for collaborative social responsibility at a time of unparalleled, accelerated change in the Information Technology Revolution.

AN ETHICAL SHIFT IN UNIVERSITY-INDUSTRY ECONOMIC INTERACTIONS

Have these major issues, pointing as they do to a fundamental skepticism about the integration of financial performance and ethical behavior, made the 1990s and early 21st century a time of caution for university-industry relationships as forecast by distinguished scholars from the perspective of academic leadership (Bok, 1991, pp. 1–19) and business ethics (Bowie, 1994, p. 99), and if not, why not?

Statistical evidence shows a dramatic growth in collaborative interactions during the 1990s between universities and industry. A survey conducted by AUTM shows that gross royalties from licenses granted by 101 universities grew from \$163 million in 1991 to \$318 million by 1994 (AUTM Licensing Survey, 1995, p. 5). The top 100 NSF research universities received 408 patent awards in 1984 compared to 1,486 in 1994 (National Science and Engineering Indicators, NSB Publication, 1996, p. 249). The 158 universities surveyed by AUTM in 1997 applied for 6,000 patents, and granted approximately 3,000 licenses based on these patents generating \$500 million in royalty income (David Guston, "Technology Transfer and the Uses of CRADAs at the National Institutes of Health", www.nih.gov/od/ott). Underneath this statistical evidence we find individuals who have come to share knowledge and pursue goals ethically in developing a network of honest communication, social responsibility and mutual trust.

Networks and relationships of trust provide the moral framework for the quality of sharing and collaboration that constitute systems of innovation with knowledge creation of socioeconomic value for the public good. The ethical key to overcoming conflicts of interest in university-industry linkages as dealt with in the recent Business-Higher Education Forum publication entitled, *Working Together, Creating Knowledge: The University-Industry Research Collaboration Initiative*, can be found in trust followed by communication (Business-Higher Education Forum, 2001, pp. 39–41).

The emphasis on corporate social responsibility has created a community, as contrasted to an individual, performance paradigm requiring companies to conduct business within an ethical framework. Corporate social responsibility means companies should adhere to basic ethical principles used in dealing with employees, customers, suppliers, stakeholders, and constituencies. The growing importance of knowledge creation and innovative applications in the Information Age should give added impetus to obeying ethical principles and their moral frameworks. Now, what does this mean for dealing with the perceived gap between the traditionally risk-averse university community and the traditional risk-prone industrial sector in the Information Age?

OVERCOMING BARRIERS AND BUILDING BRIDGES FOR UNIVERSITY-INDUSTRY LINKS

What do we mean by overcoming barriers and building bridges between the research cultures of universities and industries that continue to exist in spite of the linkages formed by breakthroughs in biotechnology and information technology and implementation of Bayh-Dole? The contrast between the university and industry research cultures that stands out in each of seven practices shows the need to overcome barriers and build bridges: (1) research for knowledge creation, and research for competitive advantage; (2) scientific achievement and commercial application; (3) rapid disclosure and proprietary information; (4) flexibility to change directions in accordance with free inquiry, and directed inquiry to company priorities; (5) cooperative and shared research, and traditionally competitive research; (6) fundamental research for new ideas and phenomena, and applied research and technology development; and (7) long-term research for knowledge advancement and urgent or short-term projects for company profit.

This basic contrast in the principles of the two different research cultures still stands today in spite of inroads from the university side by advocates and practitioners of university entrepreneurialism and academic capitalism (Slaughter & Leslie, 1997). Thus, the perception continues that certain qualities are expected of university research and others of industrial

research, putting the two cultures at opposite poles. The traditional way of doing university research in science and technology survived the 1980s in spite of the use of state and federal funds to encourage partnering with industry and to lay the foundation for entrepreneurship in university research owing to vast new areas of commercial application in biotech and infotech. Two national leaders from Stanford University, one of the first campuses to be surrounded by a community of biomedicine and computer science firms emanating from an academic research culture, reaffirmed basic academic values in separate books. Former Stanford President Donald Kennedy writes:

For the university, the essential task will be to maintain its special role with respect to the larger society: independent, provocative, but dutiful in its attention to the successor generation. From the faculty one can hope for a shift in loyalty: more scrupulous attention to the needs of the institution and its students, and a passionate commitment to new ways of knowing and teaching. And those who manage and lead the institution will need to summon both a readier willingness to assert vigorously, and if necessary defend, the university's value to the public, and the capacity to envision opportunity and welcome changes (Kennedy, 1997, pp. 287–288).

Throughout his book, he urges the university to move toward “reclamation of its central mission,” as he writes about academic duty in terms of ethical academic values. Robert Rosenzweig, who held positions at Stanford for twenty years before heading the Association of American Universities (AAU), the organization of the now top 63 universities influential in research policy, also upheld the traditional ethical culture of research values:

The values that sustain the university – openness, respect for dissent, commitment to evidence and the proper inference from evidence as the best instrument for settling disputes, integrity, intellectual honesty – are the values that also sustain a free society. Moreover, universities are their principal, and in some cases, their only exemplars and practitioners. To change the university fundamentally is to risk the loss of a great deal, indeed (Rosenzweig, 1998, p. 192).

Their defense and reaffirmation of basic academic values in university research culture put issues in the context of change and continuity for the socio-ethical responsibilities of the university to the larger society.

The element of change within the continuity of university research values benefits from the experience of the past two decades during which we have learned enough, as University of California President Richard Atkinson observes, “to work out relationships that serve industry’s needs for technology transfer and universities’ needs for open inquiry”(Atkinson, www.ucop.edu/pres/speeches.html). Or, as MIT President Charles Vest said: “Our universities must be an important part of the chain of innovation, both in the ration of new knowledge and ideas and in the education of people,” and what he calls “the chain of innovation” has to do with the future economic infrastructure and creation of new firms in a knowledge-based economy globally driven by innovation (quoted in Branscomb, 2001, pp. 83–85).

Backing off rather than moving forward with industry partnerships for the public good, in my judgment, would be a mistake. But that should include recognition of the need to eliminate heedless self-interest, to avoid poor moral judgment, and fulfill the responsibility for ethically managing risks in university-industry partnerships. And that brings us more directly to building

bridges in these collaborative relationships that involve knowledge creation and product innovation.

MANAGING UNIVERSITY-INDUSTRY CONFLICTS OF INTEREST

The realistic challenge with regard to the university-industry conflicts of interest that have arisen in the past quarter century becomes one of managing rather than eliminating them because they are inextricably bound to complex activities of research universities and their extramural sources of financial support. Previous conflicts assumed a sharp distinction between university and industry interests. The recent conflicts of interest have transcended previous divisions as a more integrated model of university-industry relationships has emerged with innovations in research linkages and a diversified network of intellectual property and technology transfer linkages. Such conflicts of interest must be managed to minimize their harm to the public good.

The challenge to university-industry linkages in R&D arises from the responsibility for managing potential conflicts of interest before they become actual ones. The dramatic development of biomedical R&D during the past quarter century has increased potential conflicts of interest between university researchers and industrial scientists (Business-Higher Education Forum, 2001, p. 35). Conflict of interest issues in university-industry collaborations, and mainly those involving biotechnology, surfaced in the late 1970s, grew in the 1980s, and show signs of continuing indefinitely despite university policies formulated and reformulated during the 1990s to prevent these conflicts. It used to be that university researchers hoped for a favorable discovery followed by widespread recognition. Only recently have they come to expect a financial gain and obtain it as soon as possible. How research universities of the 21st century manage biotech and infotech or software conflicts of interest, whether they have to deal with start-up and spin-off companies or large firms, will be a mark of their character and values.

How do regulatory policies seek to prevent those conflicts that essentially involve being unable to fulfill the demands of one responsibility in a position of trust without compromising those of another? Regulatory policies seek to prevent principal investigators from using federal or nonprofit foundation funds to (1) pay for research that creates or develops products to benefit their companies; (2) divert teaching, research, or clinical funds for private gain; (3) allow the profit motive to prevent sharing research results openly and freely; (4) exploit students, postdoctoral fellows, or collaborators for private gain; or (5) create difficulties through greed for the university as well as department or college units within it.

Obviously money becomes a major issue in conflict of interest situations and often moves people in ways contrary to deeply held beliefs. A researcher who receives funds from a pharmaceutical company finds her/his scholarly opinion on drug safety challenged; a scientist who finds a trustworthy company avoids that conflict. Institutions face real conflicts of interest also with few laws or regulations governing those conflicts. The way in which they resolve or manage those conflicts reflects institutional values and shapes the climate in which members of the institution find the guidelines for their behavior. Conflict of interest issues viewed within the context of a mixture of activities and woven into institutional fabrics pose problems of social ethics rather than individual ones.

Two examples illustrate major problems resulting from institutional conflicts of interest in university-industry biotech relationships. Scripps Research Institute, La Jolla, California, and the

Sandoz Pharmaceutical Company of Switzerland provoked opposition from both Congress and the press when Scripps gave Sandoz first rights to every discovery in the Institute. Scripps, a major NIH grantee, thus posed the problems of appropriations in granting a private corporation, and a foreign one at that, the results of research paid for by U.S. taxpayers. Consequently, the agreement underwent extensive amendment. For NIH, the result of that case led to tougher reviews of long-term agreements involving a large proportion of the institution's total research funding.

More common problems of institutional conflicts in biotech relationships became even more difficult to resolve. The second example comes from the early stage of the biotech industry when Harvard's investment managers decided to invest in a company spun off from the research of one of its most eminent biologists, Mark Ptashne. Harvard subsequently reversed the decision following criticism articulated vociferously by faculty who considered it unethical of the University to invest in Ptashne's company, one that might be in competition with the one from his primary association (Harvard). Here we can recall that the underlying question in this example had received attention in a report of the Pajaro Dunes Conference in 1982 which observed "the growing tendency, especially in the biotechnology field, for professors to own a significant block of stock in commercial enterprises, to assist in the formation of such enterprises, or even to assume substantial executive responsibilities" (quoted in Rosenzweig, 1998, p. 99).¹

Conflicts of interest may arise through combinations of public funding, private consulting, and equity holding in companies engaged in a faculty member's area of interest. These developments underscore the need for universities to consider the rules and procedures needed to ensure that faculty members fulfill their responsibilities to teaching and research, and to avoid conflicts of interest. The Pajaro Dunes Report also noted that "the research or entrepreneurial efforts of a faculty member may have the potential materially to effect the economic condition of a company . . . Under these conditions, investment by the professor's own university in the firm gives the institution a financial stake in the activities of its faculty member. This may cause others to believe that the university encourages entrepreneurial activities. Moreover, it may cause or appear to cause, the university to extend preferential treatment to the professor . . . and thus to undermine the morals and integrity of the institution" (Rosenzweig, 1998, pp. 95-96).

The Pajaro Dunes Report speaks directly to the issues in the Harvard example. In practice, however, the report's words read today as though coming from the distant past. Hardly a major research university exists, including Harvard, that has not found a device for investing in prominent companies, especially biotech ones in medicine and agriculture, whose promise derives from the work of its own faculty. Yet ethically it still seems worthwhile to consider the wisdom of the practice in spite of the money that might be lost if universities abandoned it.

The Pajaro Dunes Conference held high the banner of basic academic values. There developed in the 1990s, however, the practice of academic capitalism and the concept of the entrepreneurial university. In what I prefer to call the dawning of the "outreach university," can there be a middle way between the tradition of basic academic values and the innovation of research entrepreneurialism or academic capitalism? If so, the essence of the university reaching out to serve public good as well as to gain constituent support for its sustainability would be it. Such a stance calls for universities to avoid the pitfalls of institutional conflicts of interest by formulating guidelines and policies with the applied ethics to address those conflicts.

The third conflict of interest, termed “conflict of commitment” has come about with the rise of the research university and becomes more problematic with the entrepreneurial university. Some might say it would go away if universities got a real handle on enforcement of consulting policies. Yet loyalty constitutes the essence of the conflict of commitment issue. Actually, conflicts of commitment can be more encompassing in their causes and in the ways they affect universities than conflicts of interest. And these conflicts range more broadly than conflicts of interest that usually, or even mainly, involve making money and commercial ventures related to research. Faculty and administrators have a moral commitment to give their primary loyalty to the universities that appoint them to carry out academic duties. When those primary obligations conflict with others, the resolution should favor university duties. Conflict of commitment becomes a task of “moral suasion” rather than regulation or enforcement. To be sure, it would be helpful in resolving conflicts of commitments if universities had unambiguous policies governing consulting activity and adhered to them. Yet the heart of the matter in preventing or managing conflicts of commitment, however, has to do with underlying attitudes and values of loyalty, responsibility, and trust that should inform academic careers.

In my judgment, the Novartis-Berkeley Agreement of 1998 (Business-Higher Education Forum, 2001) between the Swiss pharmaceutical firm and the University of California at Berkeley came about in the proper ethical way, making it a good one precisely because conflict questions received attention before reaching the management agreement. Nevertheless, the prospect of that agreement raised heated ethical questions worth noting in evaluating the operation of any such agreement. First, will this university-industry research collaboration stifle scientific inquiry, steering it in the direction of product development? Second, can an agreement between a for-profit corporation and a not-for-profit organization with a fundamentally different mission and culture really work to advance the ethical goals of both? Third, how does the Novartis-Berkeley Agreement impact the university’s responsibility to create knowledge and to uphold the concept of academic freedom? Fourth, how can university researchers working in off-campus labs built by for-profit organizations avoid functioning as employees of the company?

My evaluation of the Novartis-Berkeley Agreement would seek to determine its ethical management by considering the following moral principles: (1) the needs of all stakeholders; (2) the approach that provides the greatest good for the greatest number; (3) the approach fairest to all in providing equitable benefits and burdens; (4) the approach that best develops and reinforces moral virtues and practices an active moralism; and (5) the approach that does most to advance the public good. The Novartis-Berkeley Agreement moves us into the negotiation of agreements for patenting and licensing university technology.

ENABLING THE COMMERCIALIZATION OF UNIVERSITY TECHNOLOGY

My ethical concern regarding Bayh-Dole has to do with its moral impact in commercializing university research. Bayh-Dole permits universities to profit from federally sponsored research projects both directly and indirectly by obtaining patent rights to products of federal research and by assigning patent rights to industry. Advocates of academic capitalism and the entrepreneurial university give too much attention to what Bayh-Dole means for university profit-making. Slaughter and Leslie (1997, pp. 45–46), for example, underscore how “the Bayh-Dole Act of 1980 signaled the inclusion of universities in profit making.” Undeniably, Bayh-Dole as originated by university officials and federal legislators to encourage technology transfer moved the university toward a more central position in the economy. But the ethical issues of intellectual

property and financial profit-making need attention with regard to the effects of Bayh-Dole.

The underlying theory of Bayh-Dole pertains to the needs of companies for exclusive patent rights to acquire, develop, and commercialize the results of university research. This theory undercuts the belief that patents can restrict access to scientific and technological knowledge of public value with regard to its wider use and application for societal good. The question of whether university-assigned patents and the requirement for licensing delay or expedited technology transfer remains an open one. After all, most universities have limited commercial expertise, and technology transfer experience for socio-ethical as well as financial motives.

The theory that stronger protection of intellectual property accelerates its commercialization misses the point. Denying access to research discoveries for any business entity that can make good use of it deleteriously impacts the economy as a whole and its societal benefits for the public good. Bayh-Dole carried out the belief, based on little evidence, that stronger protection for the results of federally funded research would accelerate the commercialization of research results and bring greater benefits to the economy. Thus, Bayh-Dole actually placed responsibility for the realization of its goal on universities and businesses. It appears, however, that many university administrators, in particular, continue to see Bayh-Dole as enabling profit-making through patenting and licensing the results of faculty research. But this means of technology transfer has failed to produce large profits for universities, with a few exceptions. And the shift from individual consulting practices to start-up or spin-off firm formation has benefited faculty more than their institutions except when the latter take equity in the companies. Thus, the social responsibility and federal stewardship intent of Bayh-Dole for the U.S. economy has been served poorly by universities in quest of royalty income, and increasingly by means of their taking equity positions in start-up and spin-off companies (Etzkowitz et al., 1998).

The ethical principle of mutual trust for the public good provides the strongest foundation for negotiating license agreements. Building that mutual trust when efficiently and effectively negotiating agreements depends upon knowing the needs and desires of each party in a way that puts aside suspicion and worry about taking advantage of one's partner. Interpersonal communication and empathetic dialogue become essential to successful collaboration, with shared scientific and technological interest coming next. Knowing each other's mindset and value systems through dialogue about problems concerning research areas, intellectual property, and technology transfer increases cultural familiarity and strengthens human relationships, which are always at the heart of ethics. And that process encourages both cross-fertilization and continued professional development. Companies such as Pharmacia, Dow Chemical, DuPont, and Pfizer have underscored the various parts of this ethical foundation of negotiating agreements (Business-Higher Education Forum, 2001, pp. 47-56).

The thorniest area in negotiating agreements has to do with the ownership, value, and use of intellectual property, particularly with the Internet impact on property ownership. The Internet Revolution in intellectual property truly tests open dialogue, shared or joint ownership, mutual trust and social responsibility in integrating the cultures of universities and industries.

This study has concentrated on patents as the predominant form of intellectual property in the ethics of university-industry linkages. Here the well-defined process for patents provides a sharp contrast to the ambiguities of copyrights with which I dealt in a previous study. The fruits of both patents and copyrights, however, should be to make them available for the benefit of public good in a socio-ethical as well as financially profitable way.

Moving from scientific and technological breakthroughs to market-ready prototypes of course carries risk involving financial resources to fund innovative research. But the dimension of risk that pertains directly to the ethics of university-industry collaborations concerns a trust relationship. The investor or manager knows how to bring the product to market but has to trust the researcher with regard to the projects' technical aspects. Without mutual trust the risk in moving from research invention to commercial product becomes greater. Case studies have shown that evaluating risk between knowledge creation and product development depends heavily on personal relationships of mutual trust in an institutional network of shared responsibility (Branscomb, 2001, pp. 13–19).

The institutional objectives of venture capitalists and university researchers traditionally have differed. The former has depended on the commercial viability of the technology and the latter on being responsible for the creative advancement of knowledge. But there has come about in the past twenty-five years an integration of those traditionally different objectives as research universities have become a vital source of innovative technological ideas for commercial firms, be they start-up, spin-off, or already established ones. Universities increasingly have been willing to do the research required to turn inventions into commercially marketable products that attract venture capital investments. The risk has been in the time it takes. And the willingness to take that risk of time has required sharing information and developing a trusting relationship. The nature of communication and the degree of trust between university researchers and venture capitalists form the crucial elements in the ethical management of time risk and technical uncertainty.

When scientific and technological inventions have been proven and commercially marketable opportunities have probability, efforts to move results to product development still must bridge (1) a funding gap between academia and commercial support, (2) a research gap between the curiosity criteria and the market criterion, and (3) a trust gap between scientists/technologists and managers/investors. The most important of these gaps, particularly for this study, has to be the ethical one of trust. Enabling the commercialization of technology ultimately depends on mutual trust and honest communication in sharing the risks and rewards of funding and performing research projects.

REFOCUSING THE VISION OF THE UNIVERSITY'S ROLE IN ECONOMIC DEVELOPMENT

The changing role of the research university in the context of economic development with the challenges and opportunities brought about by the Information Technology Revolution calls for a new conceptual understanding and a new vision. The prevailing vision in university-industry relationships in the broader context of economic development conceives of the university as an engine for growth. The concept of the university as an "engine for economic development," in use since the immediate post-WW II era, has become a widespread one during the rapid growth of commercializing university technology from the 1980s to the present. In the last section of this paper, I raise the question about the realism and validity of that concept. Further, I propose a broader concept and a refocused vision that comes within a moral framework for the ethics of future university-industry relationships.

The new or refocused vision being proposed here for university-industry collaboration recognizes that the university has become increasingly important in the context of technological innovation,

particularly with the Biotechnology and Internet Revolutions. It might be sufficient just to envision the university in the Information Technology Revolution as a social institution. To be sure, the university's role in the nation's innovation infrastructure for our knowledge-based capitalism extends beyond the limited concept of an engine for regional economic development. In addition, it needs to include workforce development and retraining with commercializing technology. In 1989 I wrote:

We have entered a new era of social engagement . . . with the developing bonds of cooperation among industry, universities, and government that did not exist in the 1950s, 1960s, and 1970s. Yet industries look to universities to create knowledge rather than to develop products and to educate individuals who . . . will always be the most important form of technology transfer because they have learned more about the languages, cultures, and histories of other peoples, and how the commercial, cultural and political systems of the world are linked" (Yost, 1989, p. 3; Yost, 1997, pp. 9–10, 132–134).

Now I would give more attention to the importance of knowledge development and preparing workers for our knowledge-based economy, a task that community colleges have been assuming with increasing effectiveness.

The re-envisioning I propose for the university in economic development amounts to a re-application of basic academic values to the needs of our knowledge-based economy. That requires knowledge creation, knowledge transfer, and knowledge practitioners or workers. The moral framework I propose for this vision of university-industry relationships provides an enabling context for knowledge creation from which come knowledge workers and knowledge transfer. This enabling context for knowledge creation consists of mutual trust, empathetic dialogue, and social responsibility with caring and sharing underlying each one and giving the enabling context its substance. Knowledge creation that produces knowledge transfer and prepares knowledge workers requires universities to share knowledge with others and to care about its importance for them. This enabling context of sharing and caring makes the knowledge-creation process flexible, future-oriented, and fulfilling. Caring- and sharing-based relationships enable university-industry relationships to be socially ethical and economically profitable. The care involved in professional relationships, for example, between a manager and employee or a physician and patient nurtures sharing insights, which become crucial between university researchers and industrial scientists in knowledge transfer. This enabling context of knowledge created, shared, and used in preparing workers and developing products or processes in university-industry collaborations has three main facets.

First, the ethics of university-industry relationships in the Information Technology Revolution should be primarily about people and their relationships rather than the institutional and organizational structures in which they work. Thus, mutual or reciprocal trust, learning each other's needs through empathetic dialogue, and social responsibility for public good should provide the main parts of the moral framework for university-industry relationships. Turning the inventions stemming from knowledge creation into innovations for knowledge transfer often necessitates workforce training and retraining and requires a relationship of trust between the innovators and managers/investors of a newly created firm.

Relationships of trust among a network of institutions constituted the successful systems of innovation in Silicon Valley, Boston's Route 128, and the Research Triangle Park; more recently the 'Austin Miracle' underlies the collective sharing of both risks and rewards essential to an

innovative economy. But trust always comes within the relationship it helps to create. University-industry collaborative relationships in our knowledge-based economy necessarily involve collaboration that requires trust. Mutual trust enables freedom and openness in creating knowledge where it did not exist before. Mutual and authentic trust develops through interaction and conversations in relationships with each other. The obligations and responsibilities intensify a sense of mutual identity and the importance of the relationship. This trust depends upon the relationship and its context that comes not from philosophical theories or principles but from counting ethically on each other in enabling knowledge creation and the new way of life it may bring.

The second part of the ethical framework follows the relationship of trust and caring. Empathetic dialogue makes it possible to understand each other's needs for collaboration in knowledge creation. Empathetic dialogue becomes possible only after building mutual trust. The essential feature of effective dialogue comes in listening with empathy, and involves thinking about and feeling for each other's needs and bringing to the surface deep-rooted assumptions. Acts of empathetic dialogue in relationships of mutual trust enable us to focus on university-industry collaboration as socially responsible for the public good. The process of empathetic dialogue in mutually trusting relationships can turn enlightened self-interest into a civic virtue or ethic of social responsibility.

The third part should be social responsibility, for which empathetic dialogue and a relationship of mutual trust in an overall enabling context of caring and sharing prepare the way. In the enabling context for knowledge creation, social responsibility for public good extends beyond the financial outcome of technological breakthroughs. The ethic of social responsibility, moreover, should be an essential part of knowledge creation, training, and transfer. The basic academic values for knowledge creation should go hand in hand with basic ethical principles when it comes to university-industry linkages for commercializing university technology. The collaboration involved in this process should come within a moral framework of mutual trust responsive to the needs and interests of others in managing conflicts as well as cooperation.

Information sharing in the social responsibility of university-industry collaboration involves the relationship of trust that encompasses both financial gains and ethical behavior. Social trust and enlightened self-interest in university-industry linkages make collaboration feasible. These linkages demonstrate the importance of trustful relationships in networks of knowledge creation and technological innovation for social responsibility. The relationships of mutual trust and dialogic networks of information sharing have supported successful systems of innovation in Silicon Valley, Boston's Route 128, and the Research Triangle Park that have contributed to the public good in both moral and ethical dimensions. Trustful relationships and empathetic dialogue contribute to networks of social responsibility or social capital that extend beyond the short-term self-interest and individual transactions of traditional economic perspectives.

I believe networks or networked systems of socio-ethical responsibility have great importance for the quality of collaboration in the biotechnology and information technology industries. Lastly, the growth of knowledge creation, technology transfer, and knowledge workers has blurred boundaries in academia and industry, creating problems that can be solved within the moral framework of trustful relationships, empathetic dialogue, and social responsibility/civic virtue.

CONCLUSION

The important gap that this study has aimed to fill concerns the need for expanding university-industry collaborations to develop a moral framework for the Information Technology Revolution in which ethics count. The moral framework set forth in this study takes a broad perspective that includes the meaning of mutually trustful relationships for understanding each other's needs and for contributing to the public good. A moral framework of this kind enables building trust as the foundation of university-industry collaboration that extends beyond even enlightened self-interest to work for the shared common good in which the ethics of social responsibility counts most. The incentives for universities to monitor, and even scour, their research laboratories for inventions and discoveries in which they can collaborate on and commercialize with industry have motivated them to do more in serving the public good. Yet much work still needs to be done to assure openness, responsibility, and trust so that there are truly collaborative research relationships between universities and industry in the public interest.

Developing concretely targeted systems of applied organizational ethics for solving university-industry problems that arise in particular areas of collaboration, such as conflicts of interest and secrecy in intellectual property agreements or in technology transfer processes using as a corrective the moral framework proposed in this study, remain tasks for further study.

ENDNOTE

1. For an updated AAU position, see "AAU Report on Individual and Institutional Conflict of Interest"(2001), <http://www.aau.edu/research/conflict.html>.

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