SPECIAL ARTICLES

Developing and Sustaining a Culture of Scholarship

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The culture of scholarship is best described as an environment of creativity and productivity that extends from active investigations designed to create, advance, or transform new knowledge. This new knowledge becomes scholarship when it is assessed by peer-review and made public. The culture requires active support by the administration as reflected in a dynamic infrastructure, a well-defined method of evaluation, and a system of rewards that adheres to the established evaluation criteria. In addition, the culture is facilitated by a contingent of productive senior faculty members who sustain the environment and are available to mentor junior investigators as they develop independent careers.

This manuscript begins with a brief overview of the development of scholarship in American academia followed by examples of the common expressions of scholarship in pharmacy education and how they are encompassed by the definition. Subsequent sections discuss the support and development of research, an analysis of the rewards to faculty for scholarly activities, and the relationship between scholarship and professional pharmacy education. The final section includes recommendations that colleges, as well as AACP and ACPE, can pursue to further develop and sustain a culture of scholarship in pharmacy education.

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INTRODUCTION

This manuscript begins with a brief, but important for perspective, overview of the development of scholarship in American academia. A definition of scholarship that establishes whether an activity qualifies for this moniker is presented. Then, examples of the common expressions of scholarship in pharmacy education and how they are encompassed by the definition are presented. Subsequent sections discuss the support and development of research, an analysis of the rewards to faculty for scholarly activities, and the relationship between scholarship and professional pharmacy education.

Scholarship in American Academia

The 1980 report of the Argus Commission underscored the concept that faculties in colleges of pharmacy share the responsibility of conducting scholarly activity for the advancement of knowledge and the benefit of mankind. Clearly this is a precept of the academician’s role and the foundation upon which all academic endeavors are based.

An understanding of the historical development and transformation of scholarship in American academic life is instructional and provides a foundation for the definitions that will be put forth later in this section. While a detailed historical development is beyond the scope of this paper, a brief developmental sequencing is presented below. The references cited will serve the interested reader well in obtaining a deeper and more comprehensive picture if so desired.

American scholarship can be viewed as having followed three developmental phases. The colonial college represents the initial phase. The first colleges formed in the United States were focused almost entirely on the student and teaching. Their goals were the building of character and the preparation of a new generation of civic and religious leaders. Teaching was a sacred and honored calling. Scholarship beyond the classroom was not a high priority. This period is well characterized by the words of Charles W. Eliot upon assuming the Presi-
During the 19th century the tide shifted as universities and colleges began to focus on the practical side of the educational enterprise. This was the time prior to the industrial and agricultural revolution, and it was characterized by an increasing desire for college/university education to result in skills that would translate into a productive economy. Science took on a greater importance, and the government began the land-grant program that allowed states to develop universities (sometimes referred to as “cow colleges”) that could support the growing need for individuals who were able to translate learning from the university to the farm or factory. During this time the realm of service was introduced as the second leg of what would become the modern day “three-legged” mission of academic institutions (to teach, to serve, to search). Harvard President Eliot is reported to have remarked in 1908 that; “most of the American institutions of higher education are filled with the modern democratic spirit of serviceableness. Teachers and students alike are profoundly moved by the desire to serve the democratic community...All the colleges boast of the serviceable men they have trained, and regard the serviceable patriot as their ideal product. This is a thoroughly democratic conception of their function.”

During this time the concept that the academic community could improve the function of the farmer or industrialist through focused study or investigation gave birth to the concept that applied research was a useful and beneficial role of educational institutions. The academic transition to basic research was spawned by investigations initiated outside of academia. Industry and private enterprise had already embraced the concept that basic research could lead to the opening of new doors and frontiers, and this belief was adopted by academia as an expansion of their applied research focus. The first American Doctor of Philosophy (PhD) degree was conferred by Yale University in 1861. Subsequently, the Massachusetts Institute of Technology (MIT), founded at the end of the Civil War, was recognized as the center of scientific investigation.

Foreshadowing the ultimate research university was the founding of the University of Chicago in 1892, which made the PhD degree the apex of their academic program. By 1895, University President William Rainey Harper required each faculty appointee to sign an agreement that his promotion in rank and salary would be determined primarily on personal research productivity. Thus, the transformation of American academia was complete, and the focus of many colleges and universities in America, explicitly or implicitly, was sharply tuned towards individual research productivity as the determinant of promotion and salary increases.

It was this focus on research as the dominant view and definition of scholarship that compelled Ernest L. Boyer, President of the Carnegie Foundation for the Advancement of Teaching, to write his highly cited report titled “Scholarship Reconsidered; Priorities of the Professorate.” In this report he makes the case that scholarship can be defined in various realms of academic life and suggests that each is critical and necessary for the health of academia as a whole. The four realms identified by Boyer are: (1) the scholarship of discovery; (2) the scholarship of integration; (3) the scholarship of application; and (4) the scholarship of teaching.

Scholarship Defined

Scholarship is defined as the creation, discovery, advancement, or transformation of knowledge. The fruits of such efforts are evidenced only when that knowledge is assessed for quality by peer review and made public. Thus, the defining elements of scholarship are originality, creativity, peer review and communication.

This definition incorporates the realms of scholarship enunciated by Boyer and endorsed by others. It is important to point out that the essential features commonly classified under the heading of research are properly included in the defining elements of scholarship. These are that the work is original and creative, that it stems from the application of individual or collaborative intellect, and that the work is composed in a manner that is subject to peer review and effective communication.

Scholarship Expressed

The scholarship of discovery. The scholarship of discovery, the form of scholarship most often equated with the term research, is the most identifiable type of scholarly activity since it is focused on creating or reformulating knowledge regarding a particular subject. Thus, the elements of originality and creativity are inherent, as is communication in a peer-reviewed format. The Argus Commission in 1980 stated that: “research is the activity that makes pharmacy a science rather than a technical skill.” Indeed, research demonstrates that knowledge is not static but expansive, and when properly presented it compels students to become life-long learners. In addition, research adds flavor to the
Within AACP, research has an interesting history. A committee on research was first established within AACP in 1917. In 1929 the committee was discontinued at its own request because members felt they had accomplished everything possible. In 1943 a new standing committee on pharmaceutical research was organized and charged by then president H. C. Newton. By 1953 the committee was also dropped, not because it had accomplished its mission, but rather because “the reports of the chair of the committee had become repetitive in their calling attention to the lack of support for research by deans and the frustrations of the faculty over a lack of time for research that resulted from heavy teaching loads.” The present interest of the Association in research stems from the creation in 1978 of a Special Committee on Research and Graduate Affairs.

Currently the more common expressions of discovery research in pharmaceutical education lie in the basic science areas of pharmaceutics, pharmacokinetics, medicinal chemistry, biochemical and molecular biology, physiology, pathophysiology, and pharmacology. Research in these areas is focused on mechanisms of disease, drug delivery and drug action, as well as on understanding the physiological and biochemical systems of life and disease. These investigations are directed towards the treatment of disease or ultimate design of therapeutic and pharmacist-provided interventions; however, they are also driven by the thirst for new information, and the knowledge obtained often takes years to reach the “bedside”. In addition, social and administrative scientists conduct discovery research focusing on economic, social and behavioral phenomena and processes that enable the development of theories which predict, explain and describe health care systems and human behaviors such as consumer drug utilization. There are numerous rigorously peer-reviewed journals that investigators can use to communicate the results of discovery research. Although some individuals identify discovery research as the primary mark of scholarship, the terms research and scholarship of discovery can be readily applied to other creative activities as described below.

The scholarship of teaching. Although good and even inspired teaching can be found at most colleges, this alone does not qualify as scholarship. To qualify as scholarly activity, teaching, generally in the format of curriculum development, analysis and/or outcomes, must be accompanied by some form of inquiry with the results being subjected to external peer review and effectively communicated. Thus, the scholarship of teaching lies not in effective delivery of appropriate content but more in the development of creative and original means for delivery and measuring of outcomes. Based on typical methods of evaluating teaching effectiveness, which are often student and/or colleague-based and somewhat subjective, an individual faculty member may be identified as a good or excellent teacher. However, while there is no doubt that this is an important contribution to the professional degree program, good teaching does not necessarily qualify as scholarship, and thus faculty are often placed in the dilemma of striving to fulfill a desire to teach well or to receive rewards from the institution based on “scholarship” criteria.
New realms – the scholarship of engagement. Recently, additional characterizations such as the scholarship of engagement have been proposed. The scholarship of engagement refers to the relationship between the expertise and resources of the university and the systems of the community to address social, ethical, and civic problems. This form of scholarship seeks to advance the university-community partnership in a collaborative effort to address various problems. This formulation seems reminiscent of the original heavy emphasis of the university on community outreach and service characteristic of the mid nineteenth century. Many of the descriptions of the scholarship of engagement seem similar to the scholarship of discovery or application within the context of the psychosocial/behavioral sciences/humanities realm. That is, the scholarship of engagement explores the interactions within communities or groups.

For definitional purposes, engagement, or other formulations of academic life, qualify as legitimate scholarship only to the extent that new knowledge or understandings are developed, formally peer-reviewed and effectively communicated.

The Heart of the Matter

Perhaps it is obvious, perhaps not, that Boyer’s identification of the realms of scholarship provided a vocabulary for discussing the different aspects common to modern day biomedical and pharmaceutical research. Thus, research is not just “discovery” but includes the integration and application definitions as well. The composite research activities of most academic medical centers and pharmacy schools in the United States give clear examples of these realms of scholarship. Additionally, much of this research is funded by extramural sources and communicated in a peer-reviewed manner to the community at large.

In contrast to the scholarships of discovery, integration and application, there is some debate and thus difficulty in identifying the scholarship of teaching. The debate centers on the fact that some individuals believe teaching alone qualifies as scholarship, and thus, by extension that “teaching-focused” institutions can be viewed as encompassing scholarship. As discussed above, this is not the opinion of the authors. Nonetheless, the answer to this debate over definition is not as important as the question of whether students in the professional program are handicapped by an absence of the atmosphere provided by the scholarship of research. It was the Argus commission that stated the inextricable link between the scholarship of research and the development of life-long learners, and the role of research as the differentiating factor between pharmacy as a science and a technical skill.

DEVELOPMENT AND SUPPORT OF SCHOLARLY ACTIVITY

The Culture and Infrastructure that Supports Scholarship

To establish and sustain a scholarly program, colleges must invest in the required supporting infrastructure. In many institutions, an associate or assistant dean is charged with developing and maintaining this infrastructure. Important components include core multi-user equipment and facilities with technical support, effective information technology, library resources, statistical and technical writing assistance, and student research programs that include both graduate degree and professional degree students. This infrastructure can be quite expensive and is sometimes considered prohibitive. However, if the institution values the benefits of scholarly activity to the professional degree program and the possible economic benefits of extramural funding, this expense is properly viewed as an investment. Institutions often utilize numerous revenue sources to develop and support their research infrastructure. Some of the more common include state- and/or tuition-derived income, endowments, salary recovery, and indirect costs resulting from extramural support. It is understood that salary support by extramural sources is based on the time committed to research and that indirect costs are set at the rate required to pay for the overhead resulting from research activities. Nonetheless, these extramural dollars may relieve the expenditure of funds derived from other resources and thereby serve, at least in part, to support development of infrastructure.

One other component of an effective scholarly environment is the sometimes overlooked role of productive senior faculty leadership. Junior faculty members are often recruited with minimal research training, and even those with postdoctoral, residency or fellowship training are often not totally prepared to become independent investigators. Thus, the final stages of faculty development often require a well-designed college plan for faculty mentoring. Offices of Faculty Career Development are available in some institutions; however, many colleges and departments rely upon mentorship by senior faculty. In the absence of this commitment, junior faculty members often spend unnecessary time and effort seeking to become productive and independent, and may only become frustrated by their perceived inability to compete.
Administrative Delays

Scholarly activity is often frustrated and sometimes stifled by administrative delays. These include internal delays that arise within the college or institution, such as those resulting from the institutional animal care and use committee (IACUC), the institutional review board (IRB), contract offices, patent committees, and committees assigned to monitor biohazards, radiation safety and occupational health. In most cases, these committees serve important functions by insuring that the institution meets federal and state guidelines that govern research related activities. Nonetheless, they often delay progress and can diminish investigator enthusiasm. Some institutions have offices of research administration (or sponsored research) that coordinate these review activities and are effective at establishing templates, forms and processes that streamline the reviews as much as possible. In the absence of administrative support for these activities, senior faculty are often a good source of information regarding ways of working as quickly as possible through the system.

Other administrative delays are external and largely beyond the control of the institution. The time between submission and review of proposals for extramural funding is often frustrating to investigators, especially early in their career, and this is sometimes compounded by delays in the receipt of critiques, which the investigator can utilize in efforts to improve his/her application and research program. In fact, some sources of extramural funding do not provide written evaluations of proposals, leaving the applicant little information that can assist in improving his/her proposed research. Although these issues delay funding, diminish productivity and frustrate investigators, it should be remembered that most agencies, foundations and companies work diligently to decrease the lag time as much as possible while providing reviews by individuals with demonstrated expertise in the chosen field. Faculty members often utilize pre-reviews or mock reviews as a means of improving their extramural applications and thereby possibly decreasing the time lost in revision.

In addition to the above, recent issues have arisen that add to administrative burden and thereby decrease productivity. The relatively newly developed select agents list, the restriction of foreign student access to laboratories and buildings containing select agents, and the increasing surveillance of graduate students from foreign countries have all increased the time and effort expended by institutions to support scholarly activity. While these issues understandably arose because of the threat of terrorism and risks to national security, they nonetheless often increase institutional administrative costs, diminish funds, and decrease efficiency.

In general, there is little that can be done regarding federal regulations and administrative burdens arising from extramural funding sources. As discussed above, several institutions have offices of research administration, which provide support to diminish the delays introduced by external sources, and senior investigators can often provide insight into methods of streamlining the processes. In addition, the Federal Demonstration Partnership, a cooperative initiative among federal agencies and institutional recipients of federal funds, was established to increase research productivity by streamlining the administrative process and minimizing the administrative burden on principal investigators while maintaining effective stewardship of federal funds. This group played a major role in some of the streamlining initiatives introduced by the National Institutes of Health (NIH), such as expanded authorities and recent efforts to establish an effective system for electronic proposal submission.

Sources for Extramural Support

Although some scholarly activity can be sustained with minimal resources, most research requires funding in the form of salary, technical support, supplies, equipment, travel, etc. Multiple sources of extramural support are available from federal, state, industrial, foundation and private agencies. Some of the more common sources of federal support include the NIH, the National Science Foundation (NSF), the Agency for Healthcare Research and Quality (AHRQ), the Environmental Protection Agency (EPA), the Department of Defense, the Department of Energy (DOE) and the Department of Education, which among other initiatives provides the FIPSE (Funds to Improve Postsecondary Education) program. In addition, some institutions have access to federal programs that target states with lower levels of federal research support, such as NSF-EPScOR (Experimental Program to Stimulate Competitive Research) and the NIH BRIN (Biomedical Research Infrastructure Network) and COBRE (Centers of Biomedical Research Excellence) Programs. All of these federal agencies have websites that describe their programs and application processes. Although the majority of funds from these agencies have been awarded to PhD and MD investigators, individuals with PharmD degrees have received federal funding, and initiatives to promote faculty development in pharmacy colleges is being considered. One point for significant improvement that could be proposed by AACP is the development of a dedicated
funding stream to support PharmD/PhD degree students. A program analogous to the Medical Scientist Training Program, that supports MD/PhD students across some 30 medical schools in the United States, would address the pressing and serious problem of pharmacy academicians for the future and thereby provide stability to the development of scholarship in professional pharmaceutical education.

State support for scholarly activity is also available to several colleges of pharmacy. State agencies focusing on research and development, economic development, healthcare manpower and delivery, and educational programs often have funds available to initiate and sometimes sustain scholarly enterprise. Several states have also invested a portion of their tobacco settlement funds into research and healthcare programs.

Other sources of extramural support include foundations, associations and organizations such as the American Heart Association, American Cancer Society, American Chemical Society and pharmacy-specific sources such as AACP, the American Foundation for Pharmaceutical Education (AFPE), the American Pharmacists Association (APhA), the American College of Clinical Pharmacy (ACCP), the American Society of Health-System Pharmacists (ASHP), and the American Association of Pharmaceutical Scientists (AAPS). In total there are more than 100 such organizations, some with rather broad opportunities and others that are more specific in their scope. In addition, the pharmaceutical and chemical industry provides significant support to research through funding for clinical trials, product development and investigator-initiated projects.

This broad range of funding opportunities, although available, is often not recognized by all investigators. Thus, it is important that each institution establish a mechanism whereby funding opportunities are monitored continually and individual faculty are notified of programs that align with their area of expertise. This is often accomplished by an office of research administration or by an associate/assistant dean for research.

Scholarly activity is also supported at many institutions by endowment income. Colleges, chairs and professorships are endowed with the funds often being used at the discretion of the individual to foster research programs within their unit. Common uses include provision of start-up funds for new investigators or initiatives, bridging support for active investigators who are between extramural awards, recruitment of senior faculty, travel, and outside speakers’ programs. Although sometimes used as a source of continuing support for a given program, these funds are generally more productive if used to initiate new areas of scholarly activity.

The importance of endowments to the development of productive scholarly capacity is not questioned. However, the ability to attract such funding often requires trained professionals. Development officers who are skilled in identifying potential donors, cultivating a relationship with the institution, and ultimately obtaining the support are well worth the investment. Major endowments occasionally arise from alumni association programs and individual interactions between faculty and benefactors; however, continued success at obtaining endowment support is best attained by those individuals trained and experienced in the process.

There is often debate on the issue of what is the “best” source of research support or the question of whether one source of funding is more prestigious than others. Unfortunately, this debate often evolves into discussions of whether research funded by one source is better than that funded by another. In fact, in some cases research productivity is now measured by the amount of extramural support, including the amount of indirect or overhead support, rather than by scientific impact as monitored by the quality of papers published and cited. Currently, AACP’s ranking of research among colleges of pharmacy is presented in a format that tends to diminish the importance of scholarly activity that is not funded by NIH dollars. Considering the level of non-NIH funding that supports many of our faculty, it may once again be worth re-evaluating our measures of scholarly activity by colleges of pharmacy. There is no doubt that active programs funded by NIH make a significant scientific contribution; however, it is also likely that the current economic climate will force many investigators to find additional sources of revenue. Furthermore, it should be remembered that scientific impact is not measured solely by source or level of support, and the impact of investigations that do not require major federal funding should not be overlooked. In light of the definitional framework of scholarship central to this manuscript, the basis for the AACP ranking may need to be re-considered and additional information or sources included. We would recommend that AACP alter its annual report of research support to include all sources of extramural funding, with the sources being divided into federal, industrial and other, but with the ranking based on total support with equal weight being given to all sources. In addition, scholarly output could be measured by presentations and peer-reviewed papers; how-
ever, this information may be more difficult to obtain and verify.

**Intramural Support**

While extramural funding is usually required to sustain productive research programs, intramural support is often required to initiate and broaden its scope within a school or college. Intramural funds are often invested as start-up support for new investigators, pilot funding to allow established scientists to pursue new avenues of investigation, bridging support for active investigators who are between extramural awards, funds to support travel to professional meetings as well as to other institutions to learn techniques and network with other investigators, recruitment incentives for productive senior faculty, support for the administrative staff required to maintain an efficient research program, developmental funds for collaborative interactions that can culminate in program-project or center-type awards, and funds to purchase and support major equipment and core facilities.

Although often limited, institutions have numerous sources from which to obtain funds for intramural support. Some of the more common sources include indirect cost and salary recovery from extramural awards, income from intellectual property, and recurring institutional budgets. Many institutions return a portion of the salary recovery and indirect costs from extramural support to the investigator who obtained the original award, either as salary bonus, discretionary funds for research, or both. This type of incentive program is generally a wise investment since the funds are being returned to investigators who have already demonstrated their ability to succeed. However, a portion of the indirect cost and salary recovery is often also retained as a source of intramural support for those activities identified above.

**Nurturing Junior Faculty**

With the pharmacy manpower shortage and resulting increases in class size and number of accredited schools and colleges, institutions are competing for an increasingly limited pool of faculty, especially senior faculty. This has often resulted in recruitment of junior faculty who have potential but require significant nurturing to successfully engage their research programs. Even those individuals coming from residencies, fellowships and postdoctoral positions often have limited exposure to the pressures and skills required of independent investigators. Thus, institutions wishing to develop or sustain active scholarly programs need to invest in an infrastructure that will nurture the successful transition of these faculty members. Those institutions that develop such programs are making a wise investment in their future and that of pharmacy education as a whole.

There are several components that should be considered when establishing an effective faculty development program. In some institutions these components are coordinated by an office of faculty development, while in others the burden is left with individual departments or units. Several of the components have been mentioned above but will be reiterated below to emphasize their importance in terms of faculty development and the growth of a strong scholarly environment.

One of the most important issues for faculty development is a clear understanding of the institution’s expectations in terms of teaching, service and research. Faculty members should meet regularly with their chairs to discuss their progress relative to promotion, tenure and compensation. A timetable with specific milestones of success should be established early in the faculty member’s career and reviewed forthright during regularly scheduled meetings. Once provided with a clear understanding of expectations, faculty can generally identify their strengths and weaknesses, and obtain needed assistance.

Junior faculty members present with a wide spectrum of preparedness for scholarly activity. Some arrive on campus after being involved in an active research program and will have a clear focus of their interests. These individuals may require assistance with little more than the proposal writing process, dealing with administrative burdens and access to appropriate equipment and facilities, most of which should be provided in start-up packages or as core facilities. In fact, some newly hired junior faculty members may have submitted their first application for extramural support before leaving postdoctoral or fellowship training. Support in terms of proposal preparation and administrative issues is achieved in some institutions via specified personnel in an office of research, while in many cases it is a task assigned to chairs or other senior faculty.

Other faculty members may begin their academic careers with much less experience and sometimes with limited knowledge as to their true research interests. Thus, they may need to initiate their research careers in collaborative efforts with existing established investigators and may develop most quickly in departments or programs that have focused areas of expertise. Although the debate regarding diversification versus focusing of the research enterprise within a college will continue, a group of investigators that collaborate in a specified area of research often provide a rich environment for faculty who enter the system with minimal experience.
Other important components of a nurturing scholarly program include adequate “protected” time to pursue research, an outside speakers program, travel support, and the presence of an established productive environment. In order to succeed, junior faculty members need to be given the necessary time to develop their research programs before being totally integrated into teaching and service commitments. If a new faculty member tries to initiate a research program while concurrently developing numerous lectures and serving on several committees, the outcome is somewhat predictable. However, release time alone is not the sole determinant of success. External speakers’ programs, which bring established investigators to campus, allow faculty to broaden their knowledge base and initiate productive collaborative networks. Travel support to attend professional meetings and visit other institutions is important for staying abreast of one’s field and developing off-site collaborations. Finally, the importance of senior leadership needs to be reiterated when one is hiring faculty with the intention of developing and sustaining research activity. The success or failure of new investigators is obviously dependent upon numerous factors including their training, talent and motivation; however, the likelihood of success is significantly improved when the proper environment is available to support and reward research activities.

MEASURING AND SUSTAINING SCHOLARSHIP

Perhaps the most critical component required for developing and sustaining scholarly activity in modern academia is the nature and application of an institutional system that rewards scholarship. Promotion and tenure requirements, as well as financial and other forms of compensation, are the clearest indication of the importance of scholarship to an institution. If scholarship is not rewarded it will wither, and faculty scholars will seek positions elsewhere. In addition, it is important that the definition of scholarly activity and the requirements for promotion, tenure, and compensation, along with specific methods of documentation, be stated precisely so that faculty have a clear understanding of what is expected. Finally, rewards must follow stated expectations. Inconsistencies between expectations and compensation decrease productivity by creating an environment of uncertainty, with faculty time being wasted in efforts to understand or discern what is truly important.

It should be pointed out that it is possible to sustain scholarship within a college even when multiple tracks for promotion and tenure exist. In the authors’ experience, concurrent research and clinician (or educator) tracks can in fact promote research productivity by allowing individuals to focus on areas in which they excel and thus provide more non-teaching time for faculty who wish to pursue scholarly activity. Given the significant teaching demands on faculty at many pharmacy colleges, this approach can prove to be quite beneficial in terms of research productivity. It is important, however, when establishing or sustaining such a system that the research and non-research tracks result in equal effort, equal compensation, and mutual respect.

Promotion and Tenure

Historically, promotion and tenure (P&T) evolved as a system to attract and stimulate the scientist who sought to question dogma or the philosopher who challenged existing principles. The indefinite term of appointment provided academic freedom and economic security, two principles that are the underpinning of tenure. Academic freedom is the ability to engage in ethical scholarly and creative pursuits without consideration of consequence. The indefinite term of tenure was awarded to stimulate continued scientific discovery since it was recognized that scientific discovery could advance most effectively if it was not constrained by existing beliefs. The academic freedom provided by tenure was established to foster creativity and insure that opposing political influences did not stifle it. Economic security, which also comes from indefinite appointment (although tenure at some institutions does not ensure a given salary), ensured that those engaged in scholarly and creative activities could do so without concern of financial ramifications. Scientific discovery would advance most efficiently if it were not limited to addressing only questions with economic value. Academic freedom and economic security made scholarly and creative activities attractive to highly motivated and skilled individuals.

P&T is the process by which faculty are formally evaluated to assess their contribution to the institutional mission. The process is an integral part of the academic environment and is vital to an institution. Promotion recognizes the value of a faculty member’s contributions in the areas of teaching, research, and service. Promotion is a testament that the contributions are meritorious and valuable, and therefore need to be continued. In that sense promotion serves as recognition of work sufficient to the title. Tenure on the other hand is an indefinite term of appointment for a faculty member who has demonstrated excellence in his/her contribution to the institution’s mission and who is reasonably expected to continue to produce at the same or an increasing level. Tenure guarantees a continuing appointment with cer-
tain conditions. In that sense and unlike promotion, it represents a significant long-term commitment by a college to the individual, with the hope that the return on that investment will be a lasting high level of productivity towards the institution’s mission.

The missions of many colleges of pharmacy are threefold: 1) to develop students into competent professionals through rigorous education and training; 2) to serve the needs of society by advancing the practice of pharmacy; and 3) to serve the profession by promoting new knowledge. Though diverse, these missions are intertwined. Nonetheless, one of the largest problems facing most faculty is the determination of the time and effort they should devote to activities associated with each of the three missions. Over time an evolution of the P&T process has occurred as institutions have identified the types of activities desired and those that would be rewarded. However, dichotomies have often developed as the rewards of promotion and tenure were attached to faculty scholarship, and activities such as teaching and service, while still occupying a substantial percent of faculty time, were not weighted or considered. To the extent that this creates a two-class faculty system it undermines the culture of scholarship and serves as a significant deterrent.

The issue of time spent on teaching, scholarship and service is intensified in clinical departments where faculty responsibilities are often focused on clinical practice as well as teaching, and the concern is compounded by the increasing need for clinical faculty. With the evolution of clinical pharmacy, schools of pharmacy have had to attract and will need to retain an increasing critical mass of clinical faculty. This increased demand has not only been fueled by the burgeoning clinical education resources required by the expansion of entry level PharmD programs, but also by the advent of new colleges of pharmacy that are primarily focused on education based missions. This trend has resulted in a significant increase in the hiring of new clinical practitioners-educators into non-tenure track lines in 2000-01. Clearly, clinical practitioners-educators are critical to the clinical programs of many colleges. However, recognizing their contributions and accomplishments within the framework of conventional P&T processes is often problematic. Clinical practitioner-educators do not fit the mold of the scientist/philosopher/educator. By definition, clinical practitioner-educators must divide the majority of their effort between the areas of teaching and clinical service. Although there are other reasons, the effort required to demonstrate excellence in these two areas often leaves the clinical practitioner-educator with less time for creative work. P&T committees have faced with this quandary for years. Unfortunately, even though clinical practitioner-educators are hired with expectations different from those of traditional “scientist/educators”, in many schools they are often not evaluated separately by P&T committees. This raises the question: Is the desire to be an outstanding clinical practitioner-educator any different from the desire to be an outstanding scientist? Bertolami argued no, that the want for knowledge is common to, and drives both. Nonetheless, this debate will continue, and it is probably worth considering the development of separate P&T tracks that reflect the expected contributions of the two types of educators to the institutional mission. As mentioned above, the development of separate P&T tracks can be quite productive for both the educational and scholarly missions of an institution. However, when establishing such a system it is important to insure that the research and non-research tracks result in equal effort, equal compensation and mutual respect.

Recognizing Scholarship in the P&T Process

Historically, the perception at many colleges is that P&T Committees value excellence in research and do not adequately recognize teaching and service. There are likely many reasons for this. First, research productivity is measurable in terms of the quantity of publications and quality of journals in which they are published. Secondly, research productivity is also measurable in terms of the number of grants and the amount of funding it generates. Moreover, revenue generated by research can provide resources that help ease the budgetary pressures facing many institutions. In addition, research is visible and can bring recognition to the institution. Such a reputation is often as valuable as the revenue generated and helps to attract and retain faculty. Perhaps the reason that scholarship is so heavily weighted is the view that academia is responsible for generating and disseminating new knowledge. Thus, scholarship is central to the mission of pharmacy academia and distinguishes it from other components of the profession of pharmacy. In that context the argument can be made that whether in a tenure track or not all faculty have a responsibility to generate and disseminate knowledge through scholarship.

Whatever the reason, the perception that traditional research (i.e., the scholarship of discovery) is the pre-eminent form of scholarship has been promulgated for decades. Although Boyer expanded the traditional narrow definition of scholarship in the recent past, the view
that the scholarship of discovery is more valuable to
the institution’s mission than other forms of scholar-
ship still exists in many colleges and P&T commit-
tees.\textsuperscript{2,5,15}

\textbf{The Devaluing of Teaching in the P&T Process}

Perhaps the greatest paradox in measuring and
rewarding academic productivity is the devaluation
of the function of teaching. The primary reason is per-
haps that excellence in this function is difficult to
evaluate due to a paucity of objective and validated
tools for documentation and evaluation.\textsuperscript{13,14,16} To
quote Miller,\textsuperscript{16} “If an activity cannot be evaluated
using universally recognized criteria, it will not be
universally valued.” Historically, teaching has been
evaluated based upon hours taught, student evalua-
tions, internal peer reviews, and institutional rewards
for teaching excellence. These measures are some-
what subjective and often ambiguous. The value of
teaching is also diminished by the misconceptions that
all faculty are inherently qualified to teach, that the
activity requires little time or sustained effort, and that
it does not deserve reward because it is a basic re-
sponsibility of all faculty.\textsuperscript{13}

The difficulty of measuring and rewarding teaching
is complicated by the fact that most faculty re-
ceived little or no formal training on the methods of
teaching in their postgraduate programs.\textsuperscript{13} Since they
are not trained in the actual mechanics of teaching, it
is often not practiced as a scholarly activity, but rather
as a duty.\textsuperscript{16} Those who are interested in the scholar-
ship of teaching often receive little institutional sup-
port or reward and thus abandon the effort before dis-
semination in a peer-reviewed manner.\textsuperscript{5} This contrib-
utes to the devaluation of teaching in the P&T proc-
ess. Clearly P&T committees should not merely re-
ward the act of teaching, but rather they should rec-
nounce and value teaching that advances knowledge,
stimulates active student learning, and develops life-
long learning skills in students\textsuperscript{3,13} Though such a
level of teaching was advocated in Boyer’s expanded
definition of scholarship,\textsuperscript{2} many faculty are discour-
aged from pursuing pedagogical research because of
the narrow view of scholarship described previously.

In some institutions teaching is not rewarded by
 tenure. Non-tenure track positions have been estab-
lished at several colleges, especially for clinical fac-
ulty and often for individuals who commit little time
and effort to scholarship or service. Likewise, at some
institutions tenure-track faculty who are highly active
in research have been “bought-out of teaching” in or-
der to spend more time in research. In some such

\textbf{Service: Defining the Ill-defined for the P&T Process}

Although the 19\textsuperscript{th} century focus at universities and
colleges highlighted the importance of the educational
enterprise in service to humanity, modern institutional
structures evidence little in the way of rewards for fac-
ulty service beyond the aspects of duty. Again, service
is difficult to measure objectively and therefore is often
superficially evaluated by P&T committees. Common
measures in this category include an accounting of the
number of committee assignments, leadership roles on
committees, and whether the committee was at a col-
lege, university, state or national level.\textsuperscript{13}

Another problem arising when evaluating service is
that the term is ill-defined and often applied inconsis-
tently between or even within colleges. For example, in
addition to typical committee assignments other activi-
ties that are sometimes included under the term “ser-
vice” are mentoring junior faculty, advising student or-
ganizations, and serving the general community by shar-
ing professional expertise. In his personal view of scol-
arship, Popovich\textsuperscript{17} listed activities involved in service to
the profession, such as service on editorial boards, ser-
vie as a peer-reviewer for funding agencies or journals,
etc.; while other individuals include these peer-review
functions solely as service activity. As mentioned above,
not only are service activities difficult to define, like
teaching activities they are difficult to quantify. Given
the scope of activities that can constitute service and the
difficulty in quantifying these activities, instruments to
evaluate this effort are needed.

These problems with the definition and evaluation
of service and its contribution to P&T decisions often
result in faculty spending little time engaged in these
activities. Individuals generally realize that the vague
nature of “service” devalues accomplishments in this
area. When the time intensive commitments to teaching
and scholarly activity are considered in light of the
widely held perception that “service” is a perfunctory
activity, it should not be surprising that many faculty
avoid service activities.

\textbf{Evaluating Scholarship}

As discussed above, teaching and service activities
are sometimes difficult to define and measure, while
scholarship can generally be evaluated by commonly
accepted criteria. In developing a systematic approach to evaluating all forms of scholarship defined by Boyer, Glassick and colleagues identified six standards that are common to the assessment of all types of scholarly work: clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique. These six standards for assessing scholarship are widely accepted. Accordingly, no matter its form, to be considered scholarship, every achievement must be critiqued by other scholars and disseminated. Thus, the works of Boyer and Glassick not only refined the definition scholarship, but also provided a template for more standardized assessment. Nonetheless, issues sometimes arise even when measuring scholarship.

**Issues involved in evaluating the scholarship of discovery.** Of all the forms of scholarship, discovery best lends itself to assessment using the standards of Glassick et al. However, in terms of evaluating the scholarship of discovery, one often must balance quality and quantity. The debate focuses on whether a long-term investment in an investigator who produces quantity over quality will pay higher dividends than investment in an individual who focuses on quality. In the absence of quality one can publish a large quantity of work that has little impact. Conversely, in the absence of quantity one can publish a small body of work that has enormous impact. If scholarship is to advance knowledge, it follows that quality needs to be assessed more so than quantity.

Similarly, current trends have resulted in some institutions placing more weight on the amount of extramural support, or even on the source of extramural support, than on scientific impact when evaluating scholarship. This is true in terms of discovery as well as all forms of scholarship. There is no doubt that research with high impact should sustain extramural support; however, certain forms of scholarship require greater resources than others. Even different types of basic or “bench” research differ significantly in the support required. Although funding should be included in the evaluation of scholarship, it should be only one of several markers.

**Issues involved in evaluating the scholarship of application.** The scholarship of application is essential for society and academic institutions. As mentioned above, the scholarship of application translates basic knowledge to practical application with the intention of solving problems facing individuals or society. Using the standards of Glassick and colleagues, the quality of the scholarship depends on the clarity and importance of the question, whether appropriate methods were used in addressing the question, the validity and generalizability of the conclusions, and how effectively they are disseminated.

Peer review is essential to the evaluation of the scholarship of application; however, it has its limitations. Academicians are well suited to evaluate the importance of the work, the adequacy of the methods, and the validity of the work. However, only those to whom the knowledge is being applied can judge if the knowledge has helped his/her situation. Therefore, input is required from those who benefit (i.e. the “consumers”). In many cases this is accomplished by using a measurement of outcomes that includes input from the “consumers.”

**Issues involved in evaluating the scholarship of integration.** As discussed previously, the scholarship of integration involves the association of isolated facts into perspective both within and across disciplines. In short, one who engages in the scholarship of integration is trying to determine what existing knowledge means in “the bigger picture”. “Translational research,” which tests the clinical applicability of results obtained from basic science experimentation, fits this category.

Although not necessarily collaborative in nature, the scholarship of integration often requires teams of researchers and thus raises the question of how P&T committees evaluate collaborative efforts. While independence is a desirable trait among faculty, P&T committees must not develop a narrow view of independence. Collaboration and independence should not be viewed as mutually exclusive. Independence in collaboration means that the independent participant brings their unique expertise to a collaborative effort. The P&T committee must determine to what extent the individual collaborator’s efforts are necessary for the research and thus the mission of the institution. This is often approached by examining first and senior authorship, as well as principal investigator and co-investigator status on extramural support. In addition, the P&T committee should consider how the contribution of individual collaborators fits into the standards of Glassick and colleagues. The importance of the contribution should be measured by whether the collaboration would suffer without the individual being reviewed. In short, P&T committees should not penalize collaboration if the contribution is vital to the success of the project.

**Measuring the scholarship of teaching.** As discussed above, there is some debate regarding the separation between the scholarship of teaching and scholarly teaching. Shulman put forth a working definition for distinguishing the two, which is an extension of the earlier criteria set forth by Boyer. He indicated that to be
scholarship the work must be made public, it must be peer reviewed and critiqued according to accepted standards, and it must be reproducible and capable of being advanced by others. In short, teaching becomes scholarship when it demonstrates knowledge of the field and current findings about teaching. In his personal view of scholarship, Popovich stated that the scholarship of teaching should not be restricted to events in the classroom but rather broadened to include any component of an instructional program.

As stated above, the act of teaching alone should not be considered scholarship. Rather, P&T committees should recognize activities such as the creation of new and innovative learning materials (web-based learning, texts, interactive coursework software, etc.), and new and innovative methods of teaching as scholarship once they are peer reviewed and published. Furthermore, abstracts, publications, presentations, and leadership in measuring and improving teaching should receive the same weight as other forms of scholarship, even discovery.

Sustaining Productivity

The responsibility of sustaining productivity rests with individual faculty members and the administrators of the college. A well designed and applied system of rewards for scholarship should sustain productivity so long as the infrastructure does not deteriorate. However, many institutions are currently struggling with the question of whether it is necessary for every faculty member to be recognized as a scholar. This is properly left to the desires of each institution and its administrative leadership; however, those institutions desiring that every faculty member seek recognition as a scholar undertake a substantial responsibility to provide the necessary infrastructure. In the authors experience, many institutions have decided that a mix of faculty scholars and faculty skilled in the primary activities of teaching, service, and clinical practice better fits the institutional capacity. In these cases it is necessary that efforts be focused on clear and equal application of the rewards for faculty achievement so that a two-class system does not result. Accordingly, incentive programs need to be developed with concurrent financial rewards for teaching and service excellence analogous to those for research. This is not an easy task, as mechanisms for equating excellence across these sometimes diverse areas often do not exist. The basic questions are yet to be determined. Who should be rewarded? What activities warrant reward? And, how much reward is justified? Consequently, great care must be exercised when implementing such programs because non-equivalent reward systems for these areas could generate an even greater divide between teaching and research. When developing effective incentive programs, colleges need to consider that individuals who excel in teaching and service, and devote extensive time and effort in these areas, often promote the acquisition of extramural research support by providing active investigators the additional release time required to sustain funded programs.

Clearly new and junior faculty require and deserve focused developmental efforts; however, administrators must not forget that the decision to tenure should be based upon the outcome of an evaluation suggesting that the return on that investment will be a lasting high level of productivity. Therefore, administrators need to ensure that senior faculty members do not lose their drive to produce. Among other strategies, this can be accomplished by post-tenure evaluations, by providing continuing career development through retraining mechanisms such as sabbaticals, and by encouraging active mentoring of junior faculty.

ANALYSIS OF THE RELATIONSHIP BETWEEN RESEARCH/ SCHOLARLY ACTIVITY AND PROFESSIONAL PHARMACEUTICAL EDUCATION

Research, teaching, and service are the three principal activities within most colleges of pharmacy, although the emphasis on and relationship among each activity varies tremendously among institutions. In this section, various potential benefits as well as possible unfavorable effects of research and scholarship on pharmaceutical education will be identified as they relate to the professional pharmacy degree program. In addition, approaches that may be incorporated into institutional systems to improve their interplay will be presented.

Using the premise that all research qualifies as scholarship, but not all scholarship is research, forces us to approach this topic using certain frames of reference. With that in mind, the effects of the “scholarship of teaching” on pharmaceutical education will be addressed separately from the “scholarships of discovery, integration, and application”, which are often collectively referred to as “research” in this section.

Relationship Between Research & Pharmaceutical Education

The ongoing debate over the relationship between teaching and research remains strong in higher education including colleges of pharmacy. Views on the research-teaching nexus fall within two camps. The sepa-
Academic infrastructure. First, and probably the easiest conceptualization of how research impacts education, are the positive attributes that are conveyed in terms of academic infrastructure. Some research laboratories and facilities may not lend themselves to integration into the professional curriculum. However, state-of-the-art laboratories, plentiful library holdings, and advanced computer networks are all necessities for competitive research endeavors, and these facilities and technologies are often made available for enhancing the teaching environment. The classic example is the Internet. It was the need for advanced computer networking to integrate and share research information between universities that spearheaded its development. Subsequently, the Internet evolved so extensively that it has become an integral component of the educational process, in some instances emerging into a standard tool for not only student recruitment and matriculation, but also teaching, coursework provision, and examinations.

Curriculum. Colleges of pharmacy are facing new challenges because of the move to student-centered (or self-directed) learning and the development of critical thinking and problem solving skills that will allow graduates to apply concepts to the promotion of patient health. Given the fact that research utilizes an evidence-based approach and incorporates a self-directed learning style, it is not unreasonable to expect that individuals involved in research can help integrate these approaches into an educational paradigm that focuses on life-long learning skills. Research faculty may impart this knowledge via more traditional didactic presentations or as facilitators in a self-directed or problem-based learning format. A direct benefit of research in pharmaceutical education occurs when the research-teaching nexus focuses on the processes of inquiry and problem based learning. As the practice of pharmacy moves towards an evidence-based approach, the pharmacist’s ability to acquire, process, and apply new knowledge in a systematic format has become fundamental to delivering effective pharmaceutical care. The ideologies of continuously redefining individual learning needs to adapt to the high rate of scientific and medical advancements are the same fundamental processes applied in research methodology and consequently lay the foundation for life-long learning. Hence, from a curriculum standpoint, research affects not only the educational system but the educational process as well.

Additionally, beyond the conceptual positive influences that research may have on the style and quality of education, research benefits the entire curriculum because the input of active scientists ensures that students are continuously exposed to cutting edge information.
As such, evolution at all levels of the curricula maintain pace with discovery. Faculty who are not engaged in active research can obviously stay abreast of the published literature and impart this knowledge to students in the professional curriculum, and there is no doubt that many effective faculty devote themselves to this approach. However, delays in peer-review and publication need to be considered when one defines the term “current knowledge”, and there is little doubt that individuals involved in research in a given area are better qualified to truly understand both the quality and applications of the new knowledge.

Finally, while not the primary goal of entry-level professional education programs, research exposure in the professional curricula may serve to attract pharmacy students into post-graduate training or degree programs. This is not an unimportant aspect since the pharmacy faculty of tomorrow will be derived largely from the students inspired to pursue advanced educational opportunities. Under present educational paradigms, pharmacy graduate entrance into advanced programming remains mediocre at best, and an influx of research into professional curricula may spur future students into such academic activities.

**Finances.** Most pharmacy programs are dealing with increasing student-to-faculty ratios, flat or declining sources of recurring support, and increasing costs associated with sustaining or implementing needed and/or accreditation-mandated changes in the provision of pharmaceutical education. This is coupled with increasing competition in terms of retaining and recruiting qualified faculty. Combined, these problems are creating an economic crisis for colleges of pharmacy as costs are outpacing income. Research has the potential to offset this problem by generating revenue through salary recovery, indirect cost payback, and stipend support that can be used in part to advance the teaching mission of the college by supporting educational programs and technologies. As mentioned above, while it is understood that salary and indirect cost recovery from extramural sources is focused on support of given research programs, these extramural dollars may relieve the expenditure of funds derived from other resources and thereby serve in part to support professional education.

Extramural support can also be used to fund incentive programs, which are being employed in an increasing number of universities to provide faculty salary augmentation and thereby a financial reward system that is related to performance. Such incentive programs, when appropriately administered, not only aid in enhancing faculty morale and performance, but can also promote faculty recruitment and retention. Unfortunately, while incentive programs can have a tremendous positive impact, many currently employed incentive packages are focused on extramural research funding and often ignore educational and service endeavors. As such, faculty with heavy teaching, clinical, and/or service commitments, which typically do not generate revenue, are not provided the same opportunities for financial reward. If non-research activities are important to the mission of a college, the incentive program needs to provide concurrent financial rewards for teaching and service excellence. This is not an easy task, as mechanisms for equating excellence across these sometimes diverse areas often do not exist. Even in those colleges where the mission is research-intensive, the incentive program needs to reflect the fact that individuals who excel in teaching and service, and devote extensive time and effort in these areas, promote the acquisition of extramural research support by providing protected time for active scientists.

Despite the many positive attributes that research generated revenues can have on enhancing pharmaceutical education through infrastructure, curricula, and reward systems, the circumstances are such that the extent of research funding and its role in the promotion and tenure process ultimately determine its overall impact, positive or negative. Financial needs for research equipment, space, and support may compete with educational resources and materials, resulting in shortcomings for one or both arenas. When the research revenue generated within an institution does not exceed those funds budgeted to support research (salaries, space, overhead, etc.), the expansion of educational efforts obviously cannot be realized. As such, internal resources going into “under-funded” research programs communicate a negative stream of revenue that may not be sustainable over the long term. While some argue that the benefits of research to the professional educational program warrant this expense, others believe that professional education suffers because of a decline in resources.

**Impact of the Scholarship of Teaching on Pharmaceutical Education**

The scholarship of teaching provides the fundamentals on which educational materials, methods, and assessment tools are developed, tested, and modified for the purposes of improving educational outcomes. While many colleges of pharmacy are already using educational outcomes to guide curricular change, future accreditation will likely depend on some form of formal curricular validation in all schools. Difficult decisions about curricular emphases will continue to be based on both the present as well as the anticipated future needs.
of pharmacy graduates, but the thrust of future changes will come through the scholarship of teaching. Consequently, results of studies designed to identify effective teaching methods and models that lead to positive, as well as negative, educational outcomes will become critical to the success of not just those institutions that generate data, but all programs involving pharmaceutical education.

**Impact of Scholarly Activities in General on Pharmaceutical Education**

**Effects on knowledge and teaching.** Almost all activities included under the definition of scholarship serve to inspire and advance pharmaceutical education. The creation, discovery, advancement, and transformation of disease, drug and patient knowledge (scholarships of discovery, integration, and application) generate the ideas, concepts, and principles that establish the tenets of pharmaceutical care and thus the content of much of pharmaceutical education. Likewise, with the continuous assessment of knowledge delivery, learning and curricular outcomes (scholarship of teaching) molded into the process, pharmaceutical education evolves. Consequently, academic works circulated as a result of all forms of scholarship shape the foundation for pharmaceutical education.

**Effects on faculty time and effort.** The overall mission of the college dramatically influences faculty commitments of time and effort. The compelling needs of the research enterprise require that research faculty at research-intensive universities devote a significant portion of their effort to research endeavors. This tendency is not likely to change, as research programs are requiring more time due to the changing tides in research funding and compliance. While competition for research funding remains high, current economics suggest that revenues from federal sources, pharmaceutical companies, and foundations will remain flat or even decline over the next decade. In addition, it is becoming more difficult for research revenues to maintain pace with the growth in technological, personnel, and supply expenses. Together these issues indicate that more time and effort will be required to sustain research endeavors. To compound the problem, faculty are being pressed to pay increasingly more attention to the nurturing of professional pharmacy students with faculty contact and service hours increasing due to the changing nature of pharmaceutical education. The result is a somewhat divergent struggle between scholarly activity and teaching. Under such circumstances, if the emphasis sways towards scholarly activity, then the focus means less time and effort for “quality education” and less access to faculty scholars by students. Whereas, if the emphasis swings towards teaching, then research/scholarly programs become non-competitive through a lack of effort and support, and the positive effects of research/scholarly activities on pharmaceutical education cannot be realized. In either scenario, without adequate support for both endeavors, pharmaceutical education stands to lose.

The continuing struggle for faculty time and effort raises two other closely related questions that need to be discussed. 1) Should productive research faculty be excluded from the professional teaching arena? And, 2) what is the role of graduate students, postdoctoral fellows and part-time faculty in the professional curriculum? It has been suggested by some that research faculty are too narrowly focused to provide a good educational experience for professional students, or that it may be better for productive faculty to “buy” their time from teaching and be replaced by trainees or part-time teachers. There is obvious merit to providing graduate students and fellows the opportunity to teach since many will assume faculty positions and would be well served by the experience. In addition, it may be cost-effective for well-funded faculty to “buy” extra research time by employing students, fellows or part-time faculty. In fact, some of these trainees and part-time individuals are very effective teachers. However, productive scholars should not be totally shielded from the professional students because of the knowledge they can impart, both in content and approach to learning, and because this can result in the development of a two-class system that may detract from mutual respect and ultimately diminish effectiveness in both teaching and research. An individual who can compete effectively in today’s scholarly environment is quite capable of teaching within the broad scope of the professional curriculum and should take the time to fulfill this role, even if limited in the amount of time devoted. Indeed, it may be wise on the part of an institution to ask its “Nobel Prize winning scientists” to teach the most general courses since this would provide the greatest student exposure to individuals who may unmask a student’s interest and thereby motivate the development of future scientists and academicians.

In spite of the issues raised above regarding the increasing demands placed on faculty time by both the research and teaching enterprises, the authors believe that institutional leadership can set the stage for the co-existence of both within a well designed and nurturing culture that serves to reward both activities and sustain the attitude of mutual respect among faculty of divergent skills and missions.
Why Link Scholarship and Pharmaceutical Education?

As colleges of pharmacy have increasingly emphasized and promoted active learning and teaching as a process of inquiry and discovery to encourage life-long learning skills, the multiple benefits of scholarship in pharmaceutical education have become more evident. Scholarly activity not only enhances the ability of teachers and students to keep abreast of new discoveries and therapeutic interventions, but also keeps curricular content up-to-date and relevant. Scholarship stimulates research skills and generates areas of interest, which can lead to students pursuing advanced research training and degree programs. Further, scholarship builds infrastructure and supports educational programming and technologies. In the end, enhancement of academic programs through scholarly activities also provides credibility to colleges of pharmacy and their respective academic centers. This in turn boosts the institution’s reputation in fields of excellence and enhances the prospects of future funding, which feeds back into scholarship’s beneficial effects on pharmaceutical education.

If the premise that scholarship benefits teaching is correct, then it is critical that strategies be developed to improve and validate the link between scholarly activities and professional pharmaceutical education. This concept appears to be in its infancy in colleges of pharmacy, and as such potential productive links between the two entities may remain untested. Thus, future efforts among colleges, administrators and faculty should focus on identifying the optimal relationship, and the impact of any new strategy on professional education should be assessed using the quality of the pharmacy school graduate as a measure of programmatic outcomes. It would be wise to systematically evaluate and document the nexus by developing a ‘map’ of curricular content, clearly showing where and how scholarly activities support substance and delivery.

SUMMARY

In summary, we believe that scholarship is, and must be, intimately entwined in the enterprise of pharmaceutical education. The identification of scholarship, regardless of the field or area, can be easily accomplished by asking the question “was new knowledge or understanding developed that was formally peer-reviewed and effectively communicated?” Regardless of the area of scholarship (i.e. discovery, application, teaching, engagement, etc.) the identifying characteristics remain the same.

In spite of our firm belief regarding the need for scholarship, a search of available published literature revealed that more focused analyses are required to substantiate in a quantitative manner our “conclusions” about the relative impact of research on teaching. Nevertheless, it is a prevailing assumption among most faculties in the health care fields (and the AACP as well) that active and productive research programs have a positive impact on educational quality of professional curricula.

We have attempted in the text above to provide some insight into what we believe is required to develop and sustain scholarship in a school or college of pharmacy. The definition of this culture is somewhat difficult to summarize. However, in brief, we believe that the culture of scholarship is best defined as an environment of creativity that is based on the excitement generated by active investigation that develops new knowledge. It requires support by the administration as reflected by a dynamic infrastructure, a well-defined method of evaluation that promotes scholarly endeavor, and a system of rewards that follows the established evaluation criteria. In addition, it is promoted by productive senior faculty members who maintain the environment and are available to mentor junior investigators as they develop independent careers in the sciences.

Although it might be expected in a “white paper” such as this, we have intentionally declined to identify a specific threshold of scholarship or scholarly activity that every faculty in every college should meet. The setting of a threshold and the ensuing debate regarding its extreme or minimal level would, in the authors’ opinion, serve more to divide rather than unify the profession. The position of AACP is clear and was affirmed by the Research and Graduate Affairs Committee in 1995: “every full-time faculty member is expected to participate in research (the generation and/or application of new knowledge) and its dissemination to an extent consistent with the mission of the school or college.” The emphasis that individual colleges place on the various forms of scholarly activity (discovery, teaching, etc.) will dictate the infrastructure required for their specific program, and in some cases the position of the college may be guided in part by the university setting in which they exist (e.g., private college vs. state-funded academic health center). Regardless, the development and maintenance of scholarship within a college demands continued support, critical evaluation and refinement of the environment and the scholarly work produced. Ongoing success requires that colleges clearly define their expectations of faculty as they relate to promotion, tenure and rewards, and insure that stated expectations are consistent with the rewards provided. The individual
drive of a faculty member to produce scholarly work will often exceed any set threshold providing the environment is nurturing and sufficient.

RECOMMENDATIONS

After preparing, debating and editing this manuscript, we stand in strong support of several recommendations that colleges, as well as professional societies and accrediting bodies, can pursue to further develop and sustain a culture of scholarship in pharmacy education. These include:

Recommendations to Schools/Colleges

1. Mentoring programs within the college and perhaps across colleges for all faculty, but especially junior faculty. It should be pointed out that mentoring includes all areas of scholarship including research as well as teaching, and that the level of mentoring required for individual faculty may vary dramatically because of differences in educational background and experience.

2. Implementation of PharmD/PhD programs. These could include the traditional graduate programs common to pharmacy education (i.e. pharmacokinetics, pharmacology, pharmaceutical chemistry, social and administrative sciences, etc.) as well as development in newer areas such as pharmaceutical policy, outcomes research, and pharmacy education.

3. Development of multiple faculty tracks for promotion and tenure that serve to enhance mutual respect among individuals with divergent skills without creating a faculty cast system.

4. Implementation of effective strategic planning and periodic review processes to promote and examine progress in terms of both the scholarly and educational missions of the college. As indicated by the report of the AACP Research and Graduate Affairs Committee in 1982, such a review should include self-study as well as external evaluation.

5. Systemic evaluations of tenured faculty, often referred to as post-tenure review, that serves to promote the continued engagement of scholarship.

6. Development of mechanisms to provide real rewards and incentives to faculty engaged in all aspects of scholarship including the scholarship of teaching, research, etc.

Recommendations to AACP

1. The ranking produced by the AACP of research funding in colleges of pharmacy should be expanded to include all extramural sources with equal weight being given to all. In addition, development of rankings based on scientific and scholarly impact would provide equally important metrics for comparative analysis.

2. The academy should work to enhance the atmosphere for federal support of combined PharmD/PhD degree programs through mechanisms analogous to the Medical Scientist Training Programs of the NIH.

3. The AACP should actively support or engage in serious analyses of the impact of research on teaching quality, as well as the question of whether students are more or less served by colleges with strong research programs. It may be difficult to identify the appropriate measures of performance or outcomes for this type of analysis; however, the answer to the continued debate over this issue requires a true scholarly approach and warrants the attention of everyone involved in pharmacy education. In addition, data regarding infrastructure, faculty compensation, faculty rewards, etc. are all within the realm of AACP to capture and analyze in a comparative manner across research intensive and teaching intensive colleges.

Recommendation to ACPE

As in number 3 immediately above, the ACPE should also actively support or engage in serious analyses of the impact of research on teaching quality, as well as the question of whether students are more or less served by colleges with strong research programs.

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