

STATEMENTS

Maintaining Pharmacy Education's Research Focus as the Academy Expands

Jerry L. Bauman, PharmD,^a Frank J. Ascione, PharmD, PhD,^b Robert W. Brueggemeier, PhD,^c Donald E. Letendre, PharmD,^d Jeanette C. Roberts, PhD, MPH,^e Marilyn K. Speedie, PhD,^f and Craig K. Svensson, PharmD, PhD^g

^aCollege of Pharmacy, University of Illinois at Chicago, Chicago, IL

^bCollege of Pharmacy, University of Michigan, Ann Arbor, MI

^cCollege of Pharmacy, Ohio State University, Athens, OH

^dCollege of Pharmacy, University of Iowa, Iowa City, IA

^eSchool of Pharmacy, University of Wisconsin, Madison, WI

^fCollege of Pharmacy, University of Minnesota, Minneapolis, MN

^gCollege of Pharmacy, Purdue University, West Lafayette, IN

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In 2006, dean William H. Campbell made the following observations:

For academic programs to provide quality professional instruction, full-time faculty must be actively engaged in research in the pharmaceutical sciences. . . Faculty who cannot participate in expanding the body of knowledge required by practice and science cannot be expected to provide mastery level instruction to pharmacy students. Demonstration of active engagement in the pharmaceutical sciences must include extramural support, scholarly publication, scientific presentations, and supervision of graduate (masters, PhD, postdoctoral) students. . . ¹

The authors agree with this assessment. Indeed, in crafting Standards 2007,² the Accreditation Council for Pharmacy Education (ACPE), through stakeholder feedback, listed "scholarship and research" as one of 12 areas that were emphasized in the revision process. There are different forms of scholarship,³ with research (or the scholarship of discovery) being just one. In Standards 2007, the relevant section is Standard 25 (Faculty and Staff), guideline 8, which reads:

Faculty should generate and disseminate knowledge through scholarship. Scholarship by faculty members, including the scholarship of teaching, must be evident and demonstrated by productive research and other scholarly activities, such as contributions to the scientific, professional, and educational literature; publication of books and review articles; and successes in

securing extramural funding to support research and other scholarly activities.

Although the standard may seem straightforward, it could be interpreted in different ways: from non-research forms of scholarship (eg, review papers); to alternate forms of scholarship not necessarily associated with publication, such as the scholarship of application (ie, clinical practice) or the scholarship of engagement (ie, public service); to the traditional currency of research in colleges and schools of pharmacy, with benchmarks such as competitive federal funding and subsequent peer-reviewed publications of original work in visible, high-impact journals. The authors do not wish to minimize the importance of scholarship, broadly defined³; all forms of scholarly contribution within colleges and schools of pharmacy are clearly important. Nevertheless, what we are most concerned with, and is the subject of this statement, is the latter form of scholarship, defined by Boyer³ as the scholarship of discovery. The report of the 2003-2004 American Association of Colleges of Pharmacy (AACP) Research and Graduate Affairs Committee⁴ noted an increasing concern about the "potential diminution of the academy's collective scholarship, particularly in the area of the scholarship of discovery, because of the increasing numbers of new pharmacy programs at institutions with an unknown culture of scholarship." Eight years after that report, it is now possible to objectively describe the cohort of newer colleges with regard to their emphasis on research and to preliminarily discern if this committee's concerns were well founded.

For the purposes of this paper, we compared the new colleges and schools of pharmacy (those that admitted students during or after the year 2000) and the older

Corresponding Author: Jerry L. Bauman, PharmD,
University of Illinois at Chicago College of Pharmacy m/c
787, 833 Wood Street, Chicago, IL 60612. Tel 312-996-7240.
E-mail: jbauman@uic.edu

colleges from the AACP Web site⁵ list of members with respect to their research focus. There are 45 colleges and schools of pharmacy that first admitted students during or after the year 2000 and 79 colleges in the pre-2000 group.

Of the newer colleges and schools, 10 of the 45 have “research” as a stated part of their mission (though many more mention “scholarship”). Most are not associated with academic health centers,⁶ which are great sources of interdisciplinary education and also provide access to patients for research, non-pharmacy collaborators, and a culture of translational research and discovery. Only 7 (16 %) of the 45 newer colleges and schools appear to be situated in academic medical centers and are members of the Association for Academic Health Centers (AAHC),⁶ although others may have formal relationships with organizationally distinct medical centers that were not apparent on their Web sites. Membership in AAHC requires that the degree-granting institution include a college of medicine and at least 1 other health science college (eg, pharmacy, nursing, etc) in addition to ownership or affiliation with a teaching hospital. In contrast, 36 (46%) of the pre-2000 group are a part of a university that are members of the AAHC.⁶

The mix of public and private universities in the academy has also changed substantially: only 6 of the 45 (13%) newer colleges and schools are located within public universities, whereas 54 of the 79 (68%) older colleges and schools are public. Public universities have research and economic development as a key portion of their mission to serve their state. These organizational differences are reflected in the variation in research activity in which the newer institutions are engaged compared to that in the older ones. Of the 73 colleges and schools of pharmacy receiving National Institutes of Health (NIH) funding in the year 2010 listed on the AACP Website,⁵ only 9 (12%) are newer colleges and schools (this includes 6 of the 10 who had “research” mentioned in their mission). All but 1 of these 9 colleges (University of California at San Diego) is ranked in the bottom 20 in terms of NIH funding quantity (ie, rank 53-73). In contrast, 64 (81%) of the 79 pre-2000 colleges received NIH funding.

The lack of significant research activity among universities that house the newer schools is noted by several important groups, which may impact how colleges and schools of pharmacy are collectively perceived by our higher education peers. For example, the Carnegie Foundation defines universities as “very high research” (108 total) or “high research” (99 total).⁷ In the cohort of newer colleges and schools of pharmacy, only 3 (University of California at San Diego, Southern Illinois University, and University of South Florida) of the 45 (7%) are listed as

either very high or high. Conversely, a large majority or 54 (33 very high and 21 high) of the 79 (68%) older colleges and schools of pharmacy are in the Carnegie listings. There is also a marked difference in membership in the prestigious Association of American Universities (61 members), which only invites institutions based “on the high quality of programs of academic research and scholarship and undergraduate, graduate, and professional education in a number of fields.”⁸ Eighteen of the older colleges and schools of pharmacy are located within universities that are members of the Association, compared to only 1 of the newer colleges and schools of pharmacy (located within University of California at San Diego).

Clearly, the academy of colleges and schools of pharmacy in the United States has undergone a relatively dramatic change in the past decade (Table 1). Not only has the type of university that houses colleges and schools of pharmacy changed, but there appears to be considerably less emphasis on the traditional mission of research among the cohort of newer colleges and schools. This trend could create a significant dichotomy in academic pharmacy.

Moreover, these trends do not bode well for the future of the profession of pharmacy or pharmacy education. Others have raised similar concerns.^{9,10} Since the late 19th century, pharmacy has prided itself in being a science-based profession. The profession benefits from the impact of research completed at colleges and schools of pharmacy in the United States. Pharmacy faculty members and graduates have led the way in advancing new drug therapy and health delivery methods that have resulted in significant improvements in the health status of US citizens and citizens of other countries. Moreover, many breakthroughs in drug discovery, pharmacodynamics, pharmacokinetics, pharmacogenomics, drug safety, clinical practice, and the economics of drug therapy have historically been made in our nation’s colleges of pharmacy. In turn, students have opportunities to be educated by leading scientists who create new knowledge

Table 1. Generalizations Regarding Newer and Older (Pre-2000) Colleges and Schools of Pharmacy^a

Characteristic	New	Old
Size and Funding	Small, private	Large, public
Within academic health center	No	Yes
NIH funding	No	Yes
Research intensive	No	Yes
PhD-granting	No	Yes

Abbreviations: NIH = National Institutes of Health; PhD = doctor of philosophy.

^a The characteristics summarized in this table are generalizations. There are several exceptions in both categories.

rather than just disseminating the work of others. Many of these students seek career paths as pharmacist-scientists in a variety of fields and make (indeed, have made) major contributions in their respective careers in academics or industry. In addition, those colleges and schools with vibrant research environments and graduate programs have been and will be vital to preparing the next generation of research scientists and pharmacy faculty members.

With this significant divergence in research focus, it is likely that the older, more traditional research-intensive colleges will find little commonality with many of the newer colleges and schools with regard to scholarly and creative activities. Unlike most of the long-standing colleges and schools of pharmacy, many of the newer colleges may only have the resources to support their instructional demands. However, all colleges and schools of pharmacy should have sufficient faculty members and resources to meet curricular needs *and* to support a vibrant research mission. These differences have significant potential for creating an additional chasm in how pharmacy colleges and schools approach the development of faculty members and the education of students.

The opinions herein should not be interpreted to mean that the authors believe all colleges and schools of pharmacy should “look alike.” Rather, heterogeneity with regard to overall mission, educational focus/themes, and areas of excellence should be viewed as healthy to the academy in that it reflects uniqueness, creativity, and innovation. However, we believe all colleges and schools of pharmacy should embrace a vibrant research mission. To address our concerns, we posit the following:

- (1) All colleges and schools of pharmacy should include research (the scholarship of discovery) as part of their mission. Fulfillment of this mission should be assessed based on the vibrancy of their research portfolio, which could include the traditional measurements for research productivity, such as extramurally funded projects (preferably from competitive federal agencies), impactful research publications in highly competitive and widely read journals (beyond pharmacy), and graduate research educational and training programs.
- (2) A national dialogue should be initiated on what constitutes adequate research activity among

faculty members and within colleges and schools of pharmacy. This dialogue should include a discussion of what is the appropriate research infrastructure to support these activities and a timeline for meeting the minimal expectations of research activity.

- (3) To this end, standardized qualitative and quantitative metrics should be established to measure the research contributions of faculty members and institutions (beyond NIH funding). These data should be included in the self-study during the accreditation process.
- (4) Expectations for faculty members to engage in research and creative activities should be more strongly emphasized in the ACPE accreditation reviews and standards.

REFERENCES

1. Campbell WH. PharmD accreditation standards 2007: much is implied, little is required. *Ann Pharmacother*. 2006;40(9):1665-1671.
2. Accreditation Council for Pharmacy Education. Accreditation standards and guidelines for the professional program in pharmacy leading to the doctor of pharmacy degree. <https://www.acpe-accredit.org/pdf/FinalS2007Guidelines2.0.pdf>. Accessed June 29, 2012.
3. Boyer EL. *A Special Report. Scholarship Reconsidered. Priorities of the Professoriate*. The Carnegie Foundation for the Advancement of Teaching; 1990.
4. Leslie SW, Corcoran GB, MacKichan JJ, Undie AS, Vanderveen RP, Miller KW. Pharmacy scholarship reconsidered: the report of the 2003-2004 research and graduate affairs committee. *Am J Pharm Educ*. 2004;68(3):1-14.
5. American Association of Colleges of Pharmacy. AACP Institutional Member. <http://www.aacp.org/ABOUT/MEMBERSHIP/INSTITUTIONALMEMBERSHIP/Pages/usinstitutionalmember.aspx>. Accessed June 29, 2012.
6. Association of Academic Health Centers. Criteria for AAHC membership. <http://www.aahcdc.org/AboutAAHC/Members.aspx>. Accessed June 29, 2012.
7. Carnegie Foundation for the Advancement of Teaching. Classification description. <http://classifications.carnegiefoundation.org/descriptions/basic.php>. Accessed June 29, 2012.
8. Association of American Universities. Member institutions and years of admission. <http://www.aau.edu/about/article.aspx?id=5476>. Accessed June 29, 2012.
9. DiPiro J. The 21st century Abraham Flexner. *Am J Pharm Educ*. 2008;72(4):Article 1.
10. Knapp DA. Pharmacy school provenance and pharmacy practice. *Pharmacotherapy*. 2012;32(2):99-102.