Title: Report of the 2023 AACP Council of Deans Taskforce on Pharmacy Research and Scholarship

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Abstract

Objectives: The objective of this review is to provide the conclusions from the American Association of Colleges of Pharmacy (AACP) Council of Deans (COD) Taskforce on Research and Scholarship.

Findings: The charges and the finding of the committee are: 1: Define the scholarship needs/opportunities to strengthen the outputs. The committee recommends that AACP update its definitions of research/scholarship to include discovery, integration, application/practice, and teaching/learning. A deployed survey demonstrated a high SIG research/scholarship interest. 2: Assemble a toolkit of grant and scholarship resources to assist colleges/schools. AACP should update the existing funding opportunity listing and combine with additional resources. 3: Create a framework for effective research collaboration and mentorship. AACP should identify key areas of pharmacy research and experts to serve as mentors and to meet with external stakeholders. 4 and 5: Consider the need for and purpose of a COD standing committee for research and scholarship. Explore the value of a formal research deans subcommittee. It was recommended that AACP form a research/scholarship committee or SIG and create the Pharmacy Scholarship, Research, and Graduate Education (Pharmacy SuRGE) pre-meeting to the Interim Meeting. 6: Identify key statements/outputs of the COD that need to be prepared for publication/sharing. We recommended the key statement/outputs in the areas of discovery, integration, application/practice, and teaching and learning.

Summary: The taskforce reviewed the state of research and scholarship across the academy and provided recommendations with the goal to advance research across all areas of the pharmacy profession

INTRODUCTION

Scholarship, including formal research, is a fundamental aspect of academia in colleges/schools of pharmacy. There is a large breadth and depth of research and scholarship being undertaken across the academy. Just as the American Association of Colleges of Pharmacy (AACP) is made up of diverse colleges/schools of pharmacy with different missions and goals, the focus and
diversity of research/scholarship and corresponding needs of these colleges varies. In 2022-2023, the AACP Council of Deans COD convened a Taskforce on Research and Scholarship (hereafter referred to as the taskforce). The taskforce would help AACP meet part of its strategic goal statement “3.5 – Expand Collaboration and Research.” The purpose of the taskforce was to review the current state of pharmacy research and scholarship and provide recommendations to the regarding future the scholarship and scholarship by AACP member institutions. The taskforce efforts were aimed to build upon ongoing work by the COD, create new content, and share perspectives regarding these areas in a visible format to all members. The publication of this review is the culmination of the taskforce work to provide dissemination of the recommendations.

Research/scholarship was broadly defined by the committee using the Boyer model, which states that there are four categories of scholarship: discovery (original research), integration (synthesis of information across disciplines, across topics in a discipline, or across time), application/practice, and teaching and learning (SoTL). The objectives of this article are to summarize information collected for each charge given to the taskforce and to provide a set of recommendations needed to advance this work within the academy. In addition, we aim to answer the following questions and provide a set of recommendations related to these questions: 1) Define the scholarship needs of schools/colleges of pharmacy; 2) define the ways the AACP and the COD can aid colleges/schools of pharmacy in research/scholarship; and 3) determine the key statements and outputs that needed to be researched or published.

METHODS
An integrative review and survey was conducted to answer the questions proposed for this project. To define the scholarship needs of schools/colleges of pharmacy, the taskforce reviewed
previous Research and Graduate Affairs Committee (RGAC) published reports, and existing AACP resources that assist with the scholarship needs of schools/colleges of pharmacy. The taskforce also conducted a survey of the AACP Sections and Special Interest Groups (SIGs).

First, all the AACP Sections and Special Interest Groups (SIGs) were surveyed to determine whether (i) they had a research/scholarship committee, (ii) research was included in their strategic plan, (iii) they facilitated any research collaboration, and (iv) mentoring support was provided to members of the Section/SIG. All Sections and SIGs responded to this email survey.

Secondly, a general examination of the administrative research infrastructures at schools/colleges of pharmacy was completed from publicly available websites and other information.

To define the ways AACP and the COD can aid colleges/schools of pharmacy in research/scholarship the taskforce started by reviewing items already in place and then discussed things that were missing or that needed updating. The taskforce also discussed the need for mentoring which was based off the review of the AACP Sections and SIGs.

Finally, to determine the key statements and outputs that needed to be researched or published the taskforce started with the Boyer’s definition of research and reviewed current topics of discussion in both the AACP and the COD. The list of potential publications flowed from this review.

To determine the primary and secondary recommendations based on this review, a consensus building process was employed in which all members of the taskforce were asked to review and comment on the information collected for each research question to determine recommendations. If there was disagreement, then a discussion was held with the group to rewrite the
recommendation(s). Consensus was achieved once 100% of group members agreed with the recommendation.

**REVIEW**

**Scholarship Needs of Colleges/Schools of Pharmacy**

The first question focused on the scholarship needs of colleges/schools of pharmacy and opportunities to collaborate and strengthen the outputs in the science/health professions literature. The first step was to review the definition of research and scholarship among colleges/schools of pharmacy. Previously published AACP materials have made recommendations on the definition of pharmacy research. Specifically, the AACP Council of Deans Taskforce on Graduate Education 2019–2020, and the 2016-2017 RGAC report have recommended that AACP use a single term to define all types of pharmacy-based research. The suggested term was “Pharmaceutical Research”, which would include both traditional pharmaceutical sciences disciplines (medicinal chemistry, pharmaceutics, and pharmacology) as well as clinical and translational research that encompasses experimental therapeutics, pharmacoeconomics, pharmacometrics/data analytics, practice-based, and health policy and outcomes research. However, this prior taskforce/RGAC recommendation encompasses only three of the Boyer model areas: discovery (original research), integration (synthesis of information across disciplines, across topics in a discipline, or across time) and application/practice. It omits the fourth area of scholarship of teaching and learning.\(^1\) Therefore, it is recommended that AACP and the COD provide a final and all-inclusive definition of research and scholarship that encompasses all areas of the Boyer model by also including SoTL. This new definition would help to ensure that pharmacy research encompasses all scholarly efforts by members of the academy.
Next there was a need to evaluate the research needs of the academy by conducting a survey of the AACP sections / special interest groups and by completing a general examination of the research infrastructures at colleges/schools of pharmacy. One hundred percent of the groups surveyed responded. Survey results demonstrated that Research and Scholarship were stated as ongoing initiatives in most Sections and SIGs as components of subcommittees, strategic plans, and/or collaboration and mentoring efforts. A total of 20 out of 29 groups have formal efforts in these areas currently. Nearly all groups indicated either interests or informal groups working in this space. Common themes across all groups with a subcommittee / strategic plan or collaboration/mentoring were promoting research and scholarship by members through facilitating research tools, monthly research seminars/discussion groups, and forums for building collaborative efforts. Collaboration and mentorship were the most prominent themes with 17 out of 29 SIGs providing organized efforts. For Sections and SIGs that have all three components (subcommittees, strategic plans, and mentoring efforts), there are several commonalities. These include having an award related to scholarship and/or help for those that want to apply for the AACP New Investigator Award grant, dissemination of results of the research projects started by members and providing an organized method for Section/SIG members to find collaborators. For those groups with no formal research committee, some support and mentoring are provided to the members; however, the overall planning and organizational commitment was not as strong as those with a formal research committee. Groups that did not have any of the components are not closely linked to research, such as the Student Services, History of Pharmacy, Administrative and Financial Officers, and Administrative Services Section/Sigs, which are logical based on their primary functions. For full survey results please see supplemental Table 1.

Recommendations based on these results are summarized in the Recommendations section.
Upon a general examination of research infrastructures at schools/colleges of pharmacy via publicly available website information, it was observed that a significant number of institutions, especially those that are teaching-intensive or less research-intensive, do not have designated Research Deans. Moreover, research efforts in SoTL, clinical practice, health outcomes, and other areas are often under the purview of Associate or Assistant Deans of Academic Affairs, Department Chairs, or a position other than a designated Research Dean. Broadening the AACP definition of research to encompass all areas of pharmacy scholarship will require identification of the key leadership members responsible for advancing scholarship efforts within their institution. It is recommended that AACP aid in the identification of the individual leaders across our institutions to aid in the success of collaboration, mentorship, and impact of our collective efforts in research and scholarship. Specific recommendations from the taskforce related to this charge are listed in the Recommendation section of this paper.

Assisting Colleges and Schools with Research and Scholarship Missions

There are multiple identified opportunities for AACP and COD to aid colleges/schools of pharmacy in research and scholarship. In addition to those mentioned in the previous section, there is a need to assemble a tool kit and programming of grant and scholarship resources to assist colleges/schools in being successful.

AACP already has research Funding Opportunities available on its website\[10\], which may serve as a foundation upon which a comprehensive “tool kit” may be developed. This resource, although extensive, could be expanded to include additional funding opportunities such as those provided in Table 1. This resource and the rest of the tool kit could be further expanded through programming, such as the grants and mentoring programs to be developed by the 2023-24
Research and Graduate Affairs Committee, which can identify and source information, materials, and templates to be added to the tool kit for future additions and updates.

Another existing resource developed by AACP is a resource guide entitled the “Integration of Clinical Pharmacy Faculty in Professional Practice Care Settings”. This resource provides guidance on developing practice models that achieve success for the practice site, teaching needs, and student learning. This resource could serve as a model to develop a resource for those interested in the SoTL. Another method for developing resources to aid in development of grants and other scholarship would be to leverage the expertise in research intensive schools/colleges of pharmacy to conduct workshops and sessions at the AACP Interim or Annual meetings, as AACP webinars, and/or conduct an AACP Institute on advanced data analysis in pharmacy practice and SoTL.

There is also a need to create mentorship opportunities to aid in further research collaborations across the academy. A framework of effective mentorship needs to consider an individual’s entire career from pre-faculty (or postdoctoral positions) through early-, mid- and late-stage investigators. Several ideas were put forth related to this charge: using the AACP profile features to identify research experts willing to provide mentorship, partner with other organizations (American Association of Pharmaceutical Sciences, American Society for Clinical Pharmacology and Toxicology, International Society for Pharmacoeconomics and Outcomes Research, American College of Clinical Pharmacy, American College of Clinical Pharmacology, and others) to share research collaboration tools, and develop new stand-alone tools as necessary. The latter could include a list of research strengths (or needs) (design/methodology, statistics/analysis, etc.), type of research (clinical, benchtop, or SOTL), and perhaps time zone. A committee (mentoring or research) could help facilitate the data collection and pairing of
mentors to mentees. Data collected through the annual AACP Funded Research Grant Data collection could be leveraged to identify individual experts and institutions with strengths and resources in different areas of pharmacy research and graduate training.

Effective research *collaborations* start by identification of common areas of research interest. The success of such platforms would require individuals using the AACP websites, meetings, and other services to find and identify individuals at other institutions with which to collaborate. The major obstacle is that many of the basic science faculty are not members of AACP and defer to organizations within their individual research disciplines. Therefore, it is not advised that AACP attempt to create a database of interests from its members to build research collaborations. Instead, it is our recommendation that AACP should identify key areas of pharmacy and pharmaceutical research and experts from affiliated partner organizations who are leaders in those areas. Such an effort would be particularly fruitful when combined with AACP serving as a national pharmacy-specific voice to invite and include external stakeholders (FDA, industry, NIH, and foundations) to join in the conversations with the national pharmacy research thought leaders. These experts could also be invited to serve as mentors for junior faculty/researchers.

To aid in development of some of the items addressed in this section, the taskforce did discuss the need for additional committees related to research and scholarship within the Council of Deans. AACP is home to pharmacy schools with diverse research needs and interests. Therefore, to address a range of needs across our entire association, it is essential that a potential standing committee be comprised of members representing schools with varying levels of research emphasis and capacity and with different Carnegie Classifications. It is also important to consider research-related work that is already being done with the academy by other groups such
as the sections and SIGs. As discussed previously, the taskforce worked with an AACP liaison to administer an AACP Sections and SIG survey, which determined that research and scholarship were ongoing components of subcommittees, strategic plans, collaboration and/or mentoring efforts. Based on this information, it would be potentially beneficial to create an AACP Research and Scholarship Committee or SIG. The purpose of this committee or SIG would be to work with AACP Sections and other SIGs to develop programming that would benefit the research already being done with the academy (grant writing workshops, methodology workshops, etc.,). This body could also work with Sections and SIGs to disseminate publications and ongoing projects to aid in cross collaboration to lessen colleges/schools and AACP silos.

Lastly the taskforce reviewed the 2017-2019 AACP Research and Graduate Affairs Committee (RGAC) recommendations pertaining to creation of a standing meeting related to graduate education. Specifically, the RGAC was provided a charge to “Provide guidance on emerging areas for innovation in graduate education”. In response, it was the RGAC recommendation “that AACP develop a standing committee of graduate program deans and directors to provide guidance to member schools in support of graduate program representation at AACP meetings, develop skills for interprofessional teamwork and augment research through integration of Pharm.D., Ph.D., postdoctoral associates, resident, and fellow experiences.” The current COD taskforce fully supports this prior RGAC recommendation. Moreover, we propose to extend this recommended committee to include discussions of research and scholarship along with graduate education, i.e., the recommended Research and Scholarship Committee or SIG. We further propose that a new Pharmacy Scholarship, Research, and Graduate Education (Pharmacy SuRGE) meeting be held as a pre-session to the annual Interim Meeting, thereby allowing both AACP Interim registrants and non-registrants to attend. In this format, Deans of
Colleges/Schools of Pharmacy with interests in this area could highly encourage Deans of Research and Graduate Education and other key leaders responsible for college/school scholarship to attend the pre-meeting and/or the entirety of the Interim Meeting, as necessary. This Pharmacy SuRGE meeting could borrow the format of the successful Administrative and Financial Officers SIG Meetings. We also suggest that the Pharmacy SuRGE meeting be organized by the Graduate Education SIG in conjunction with the Research and Scholarship Committee or SIG and with input from the AACP RGAC. It is of note that the current Pharmacy Deans Research Group can serve as the initial and future partner for development of the Pharmacy SuRGE pre-meeting.

Key Statements/Outputs Recommended to AACP and the COD
This section addresses the third charge given to the taskforce of determining the key statements and outputs that need to be researched or published based on the current environmental challenges, health issues, and previous COD committee and taskforce work that benefits the profession (science/ teaching/practice) over the years. This list is to address current issues recommended for needed COD statement/outputs in the upcoming year(s) and is not necessarily an all-inclusive list of important current and/or future issues for the profession. The recommendations are divided into the Boyer definitions of scholarship with the italicized headings under each as the recommended areas of emphasis in response to this charge.

Discovery (original research)
Advancing pharmacy research of impact from discovery to societal outcomes.
There is a great scientific need for pharmacy research expertise in everything from drug discovery, development, product formulation and delivery, through clinical efficacy and application. The majority of drugs and therapeutic intervention failures during development are
due to inadequate consideration of factors related to drug action and/or pharmacology.\textsuperscript{13-15}

Research in regulatory science, drug utilization, and health policy specifically related to drugs and devices are also increasingly supported by schools of pharmacy. As such, research in schools of pharmacy should be fostered to promote discovery of novel interventions that impact overall public health. Many funding opportunities (e.g., FDA CERSI, and ARPA-H) exist to support the advancement of new discoveries to improve health outcomes and address social determinants of health; thereby, promoting the impact of pharmacy-based discovery research is essential to create novel interventions and improve human health. It is incumbent on pharmacy faculty to conduct impactful research, train future generations, and demonstrate our impact on innovative health care research.

Integration (synthesis of information across disciplines, across topics in a discipline, or across time)

\textit{Value of collaborative research.}

Collaborative and translational research promotes the convergence of expertise across disciplines, learning of new skills, access to funding, and higher quality of results. Research collaborations provide opportunities for investigators to learn how different disciplines approach existing problems and allow for sharing of resources and ideas. Intra- and interprofessional collaborations with clinical and basic scientists are fostered by schools of pharmacy. Academic medical centers with schools of pharmacy have enriched portfolios of collaborative research. Collaborations extend beyond the university setting to collaborations with FDA and industry. These multi-sector collaborations are and should continue to be highly supported in colleges/schools of pharmacy.

\textit{Role of diversity, equity, and inclusion in research.}
A diverse and inclusive workspace creates a culture of new ideas and innovation. By facilitating the success of faculty and research trainees, with a specific focus on removing barriers faced by individuals from underrepresented and minoritized groups, the academy will advance its research mission and contribute to the diversification of the research community within the academy and the research workforce nationally.

Application/practice

*Impact of pharmacy application/practice on disease prevention and progression.*

As the most accessible health care provider in society, pharmacists provide care to a wide-array of hospital, ambulatory, and community care settings.\(^{16,17}\) The impact of pharmacists care was never more evident than during the COVID-19 pandemic. It is vitally important that our profession not lose the momentum that was gained from our efforts to vaccinate our communities and provide care when the rest of the world stopped. We are the frontline health care practitioners that can impact a wide array of society’s most challenging health care problems. It is recommended that the COD continue to leverage the “post” pandemic platform to demonstrate our impact through the wide array of innovative pharmacy care settings that we serve. AACP should continue to support implementation science, practice and clinical research by pharmacy faculty to continue to build the evidence base for and promote adoption of enhanced pharmacy services that improve patient outcomes.\(^8,18\)

The pandemic also created challenges and opportunities for practitioners and researchers alike, as well as our students, and academics. At the height of the pandemic, most institutions of higher education limited in-person activities, resulting in the disruption of research and training activities. Similarly, as hospitals shifted to treating COVID-infections, clinical research in other areas suffered major disruptions. Conversely, the accessibility of pharmacists and the importance
of pharmacy-based research has taken center stage during the pandemic. These challenges and opportunities will have the greatest impact on our early investigators, who were still in the process of establishing their career, getting their first major grants, and/or writing their first independent manuscripts.

Wellness / well-being

As many as 30-60% of college students now experience depression and/or anxiety, which is negatively impacting enrollment, retention, class participation, morale, and health.\textsuperscript{19-21} Faculty and staff are also impacted, dealing with their own health, their family’s health, and/or recognizing and trying to mitigate their students’ struggles. Studies to understand mental health challenges and develop impactful approaches to improve mental health and well-being of our faculty, staff, students, and for the communities for which we serve are of utmost importance for our collective future.

Teaching and learning (SoTL)

\textit{Scholarship of teaching and learning (SoTL).}

SOTL has expanded within pharmacy education within the last decade, to the betterment of the academy. This type of research and scholarship should be valued alongside traditional pharmacy and pharmaceutical sciences research and scholarship. Assurance that SoTL is conducted at the highest level of educational research standards will be essential to promote our research within and beyond our profession.

\textit{Competency-based education.}

Flexible progression rates for pure competency-based (non-time-bound) education could be challenging with the rate of change in medical advances and new pharmaceuticals. It also creates
a self-paced type of pharmacy program. This area of future development should involve both careful implementation and thorough assessment of impact. Given both the importance and complexity of competency-based education it is recommended that continued research be conducted as a pharmacy-led initiative. Currently, graduate education is truly competency based. Approaches to incorporate the best elements of competency-based education from our graduate offerings into PharmD and other educational programs is encouraged with the subsequent contributions to scholarship.

**Recommendations**

After reviewing all the information collected for each charge, the taskforce created primary and second recommendations to allow this work to continue.

Primary Recommendations:

The following recommendations are in direct response to the AACP COD taskforce charges and include:

1. AACP and the COD should create an updated definition of research and scholarship that encompasses all areas pharmacy research and scholarship represented by the Boyer model.¹

2. AACP should build on the existing research Funding Opportunities website to create a “one-stop” toolkit to aid the sections/SIGS in achieving research/scholarship goals. Expanded resources could include research, scholarship, and mentoring tools (collaboration database, grant writing workshops, and others) both developed by AACP and from partnering national associations.

3. AACP should identify key areas of pharmacy and pharmaceutical research and experts from affiliated organizations who are leaders in those areas. Such an effort would be
particularly fruitful when combined with AACP serving as a national voice to invite and include external stakeholders (FDA, industry, NIH, and foundations) to join in the conversations with the national thought leaders. These experts could also be invited to serve as mentors for junior faculty/researcher.

4. A significant number of schools/colleges have research and scholarship under the purview of Associate or Assistant Dean of Academic affairs, Department Chairs, or entity other than a formally named Dean of Research. Therefore, it is recommended that AACP aid in the identification and searchable listing of the individual leaders with primary responsibilities in research and scholarship.

5. AACP should develop a committee or independent special interest group of research and graduate program deans and directors to advance research and scholarship to both the Sections/SIGs and to the Pharm.D., Ph.D., postdoctoral associates, residents, and fellows.

6. AACP should facilitate the creation of a Pharmacy Scholarship, Research, and Graduate Education (Pharmacy SuRGE) pre-meeting to be held prior to the annual Interim Meeting.

7. AACP should develop key statements/outputs in each of the areas of innovative pharmacy impact through discovery; integration through interdisciplinary and inclusivity research; application to for disease prevention and progression; and through the SoTL research, including competency-based education and other contemporary educational topics.

Secondary Recommendations:

Additional recommendations to advance pharmacy research and scholarship include:
1. AACP should provide structural implementation support and recommendations to encourage Sections/SIGs to develop formal unified format research and scholarship efforts, particularly when there is strong interest by the Section/SIG membership.

2. AACP should establish, gather, and disseminate publication and collaboration needs across all sections/SIGs, to provide interested groups with the tools to encourage and promote research collaboration both within and outside our association.

3. AACP should foster and reward a diverse, equitable, inclusive, collaborative, and accessible research environment in which all faculty, students, and staff have opportunities to achieve their goals.

4. AACP should encourage schools to add scholarship of teaching and learning (SOTL) for faculty promotion.

5. AACP should develop a resource such as the one for the “Integration of Clinical Pharmacy Faculty in Professional Practice Care Settings” or develop partnerships with existing resources and Schools and Colleges of Pharmacy that will serve as a resource for those interested in the SoTL.

6. AACP has ongoing efforts by its sections, SIGS, faculty, and schools for addressing the heightened mental health issues facing students and employees. AACP should encourage continued research and collaboration in this area to help address best practices or innovative methods in improving mental health and well-being.

There are several limitations to this project. The first limitation is systematic reviews were not conducted for each research question, therefore, there may be some information missing that would lead to slightly different recommendations. Secondly, while the taskforce was made up of
many different schools/colleges of pharmacy, it is possible that there are areas of scholarship and research that are missing from the recommendations.

CONCLUSION
The most important takeaway message from this taskforce’s work was a clear need for increased support for pharmacy research and scholarship to maximize the impact of our collective work on society. Pharmacy research is essential at every step from discovery through societal impact and our expertise is needed to improve success at all levels. The recommendations from the taskforce are centered around a comprehensive definition of research/scholarship, expanding collaboration needs, and the creation of new committees/premeetings with the collective goal of maximizing the future impact of pharmacy research and scholarship for dissemination outside of the walls of our profession.
REFERENCES


CRediT Author Statement
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Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Table 1: Identified Funding Opportunities for the AACP Pharmacy Toolkit.

<table>
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