AACP ARGUS COMMISSION

FORECAST 2025

Contents

American Association of Colleges of Pharmacy AACP

Pharmacists Help People Live Healthier, Better Lives.

Foreword

The 2024–2025 Argus Commission, comprised of the five previous AACP presidents and current AACP CEO and Executive Vice President, was charged by AACP President Anandi V. Law, PhD, FAPhA, to develop this edition of the AACP Argus Commission Forecast. The intent of the Forecast is to provide substantive guidance to colleges and schools of pharmacy in their strategic, academic, and research planning and visioning. This second edition of the AACP Argus Commission Forecast offers insights into emerging trends that will impact colleges and schools of pharmacy and the profession of pharmacy, as a whole. The 2024–2025 Argus Commission is grateful to all who facilitated the process of creating a tool that serve as a guiding light going forward for the pharmacy academy. It is important to note that the recommendations included in this Forecast are the opinions of the authors, meant to be provocative and thought-provoking, but are not official policy statements of AACP or its Board of Directors.

The Argus Commission acknowledges that your comments and suggestions are essential for providing input into this process and for future Forecasts. Please send your comments about this process, suggestions for improving future forecasts, and any recommendations for topics to include in subsequent forecasts to Lee Vermeulen, AACP CEO and Executive Vice President, at LVermeulen@aacp.org.

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Acknowledgments

The editors recognize the time, effort, and expertise of the many contributors who participated in making this forecast a resounding success. The editors are grateful to Bill Zellmer and the ASHP Foundation for their work in creating the ASHP Forecast, which served as the methodologic model for this AACP process. The editors also appreciate Adam Jackson, AACP Manager of Governance, Tricia Gordon, AACP Design Director, Elizabeth Alida Stern, AACP Editorial Director, and the AACP Board of Directors for their contributions to several aspects of this project.

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Introduction and Methods

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Introduction

Academic pharmacy, like much of higher education, faces tremendous challenges that require thoughtful planning from academy leaders and those in individual colleges and schools of pharmacy. Academic pharmacy is not immune to the demographic, philosophical, fiscal, and political shifts in society that are impacting higher education. Adding to the lack of clarity regarding academic pharmacy's future are disruptions in health care, such as workforce trends, application of technology, and payment policies, each of which creates challenges and opportunities for pharmacy practice. Well-informed and well-planned preparation is essential for all institutional members of our academy to capitalize on opportunities that exist in times of turbulence. Structured, recurrent forecasting that explores the environment in which our colleges and schools operate is essential so that academic leaders can adapt and align their organizations for success.

Following the success of the AACP Argus Commission Forecast 2024 the 2024–2025 Argus Commission set out to provide a second edition to assist AACP members with creating well-informed, stakeholder-driven, visionary, and strategic plans. The AACP Argus Commission Forecast 2025 has been developed to bolster strategic planning and decision-making efforts at member institutions and in the academy, as a whole.

Methods

The use of "wise crowds" has been a tool for forecasting that takes advantage of broad-based groups in which each panelist provides input based on their locally- and globally-informed perspective. The collective view of the crowd is more informative than any one individual's view. James Surowiecki's *The Wisdom of Crowds*[1] has been used by other health-related organizations to synthesize the power of a diverse group of individuals. The AACP Argus Commission Forecast 2025 is modeled on the successful methods and approach used by the American Society of Health-System Pharmacists[2] (ASHP) and the American Hospital Association[3] (AHA) in their forecasting efforts over many years. Their forecasts have provided health-system pharmacy leaders and hospital and health system executives with critical guidance, as this report supports the pharmacy academy. Forecasting is not well-suited to quantitative methods, while using "wise crowds" provides informed predictions. The 2024–2025 Argus Commission mapped out a process that harnesses these evaluation strengths by obtaining the perspective of key members of the pharmacy academy, thereby synthesizing individual perspectives into a strong, collective view.

Comprised of the five most recent AACP presidents and the AACP Executive Vice President and CEO, the Argus Commission provides an ongoing and informed membership for this Forecast. The Argus Commission conducted an environmental scan that focused on the three "legs" of the academic stool—education, practice, and research. Two additional themes were identified as being critical at this time: first, the need to address issues regarding the financing of pharmacy education; and second, the evolving impact of artificial intelligence (AI) on education, research, and clinical practice. Once these 5 themes were identified as the starting point for developing the survey, specific scenario statements from the broader environmental scan were categorized within these themes and established as a baseline survey. These specific scenario survey items and their perceived impact on the pharmacy academy for the next 5 years guided the development of the items within each of these 5 themes. Initially, there were over 100 survey items that were crafted to delve into these areas and then pilot-tested for clarity and face validity, with the final survey including 43 items. The 2024–2025 Argus Commission is grateful to the AACP Board of Directors for serving as the pilot group.

Across the 5 themed areas, the 43 items reflect scenarios that survey respondents were instructed to consider and rate based on how likely they may occur in the next 5 years. Survey respondents were asked to consider their "top-of-mind" reaction to the likelihood of the scenarios occurring on a four-point grid of agreement (very likely, somewhat likely, somewhat unlikely, or very unlikely). More details of survey respondents' make-up and demographics are provided below.

Results

Forecasting using the "wisdom of the crowd" depends a great deal on the strength of the survey respondents. Thus, the make-up of the respondent group, including their background and involvement in the pharmacy academy, is essential. The Argus Commission identified informed, learned, and actively involved members of the pharmacy academy to participate in the Forecast survey. Respondents came from a number of select groups, including CEO deans, past AACP presidents, individuals who volunteered to serve on AACP standing committees, and past graduates of the AACP Academic Leadership Fellows program, among others. Over 1200 individuals were asked to serve as survey respondents, and 496 accepted. The actual survey participation rate for this forecast was substantial, with 408 respondents completing the survey (response rate of 82%), demonstrating the commitment of the pharmacy academy. As active members of AACP, survey respondents have great insight into the pharmacy academy and knowledge of the challenges and opportunities we all face, as well as informed perspectives about our future. At each stage of developing and implementing this forecast, it was clear that enthusiasm for the project was quite strong.

Information about the composition of the survey respondent pool is provided in the accompanying graphs. Note that responses to demographic questions in the survey were optional; thus, the percentages presented here do not equal 100%. The regional distribution of respondents varied, with greater representation in the South Atlantic and Great Lakes regions than in New England and Mountain regions (see Figure 1). This distribution is consistent with that of colleges and schools of pharmacy across the US, and the results of the previous AACP Argus Commission Forecast. A larger proportion of survey respondents (54.9%) were from public than private institutions (41.2%, see Figure 2).

More women (55.6%) than men (35.8%) responded to the survey (see Figure 3), and most survey respondents (65.2%) have worked in the pharmacy academy for more than 15 years (see Figure 4). Over 80% of survey respondents identified themselves as pharmacists (see Figure 5). The largest group of survey respondents (49%) indicated they were in pharmacy practice, while 24.5% reported they were in administrative roles. A smaller proportion (15.7%) stated they were in the basic science faculty at their colleges or schools of pharmacy (see Figure 6). Of those respondents who indicated they were practice-based faculty, nearly half reported being in ambulatory care roles, while 38.7% were in acute care (see Figure 7).

Forecast Highlights

Results from the survey statements are included in the themed sections of this forecast. Using the outcomes, authors (one Argus Commission member along with one or two other noted experts in that area, chosen by the Argus member) provide a discussion and recommendations that build on the individual scenarios and overall conclusions therein to enhance pharmacy academy and individual college and school of pharmacy strategic planning.

Anne Lin and **Rae Matsumoto** authored the themed section on financing the pharmacy education enterprise. The Argus Commission dedicated a section of the Forecast survey to this theme, recognizing the various factors that continue to challenge administrators responsible for the fiscal management of colleges and schools of pharmacy. This section addresses several subthemes that influence the financial health of programs, including faculty salaries, costs associated with experiential education, trends in PharmD program enrollment, and potential opportunities for revenue diversification.

In the research and graduate education section, **Russ Melchert** and **Vicki Ellingrod** summarize key outcomes and recommendations related to research. Research funding is considered (note that topic as a common element of several sections of the forecast), as well as a discussion of future core competencies for graduate education. With respect to research, Drs. Melchert and Ellingrod discuss survey results associated with dynamics in biomedical research funding, variations in trust of science, and use of non-university-owned laboratory infrastructure. We note that the Forecast survey responses were collected prior to the start of the current presidential administration, which could influence respondent opinions in ways not reflected in the results presented.

In the pharmacy education section, **Stuart Haines** and **Michelle Farland** describe this section's Forecast results in 2 themes: student success and curricular innovations. Drs. Haines and Farland explore trends in assessment of student readiness for the rigors of a PharmD program, opportunities for the use of adaptive learning technology, and support for students who require temporary leave from their academic program. Considering the future of pharmacy education, the authors comment on Forecast results related to the application of competency-based education, the integration of digital therapeutics, opportunities for remote learning, and the degree to which colleges and schools may adopt specialized pathways within PharmD programs.

Turning to the practice section, **Craig Cox**, **Melissa McGivney**, and **Brian Hemstreet** address the rapidly evolving environment regarding scope and payment for pharmacists' patient-care services and educational strategies to prepare a pharmacy workforce for emerging practice opportunities. The authors comment on Forecast results that explore

Figure 1

Regions where Respondents are Employed

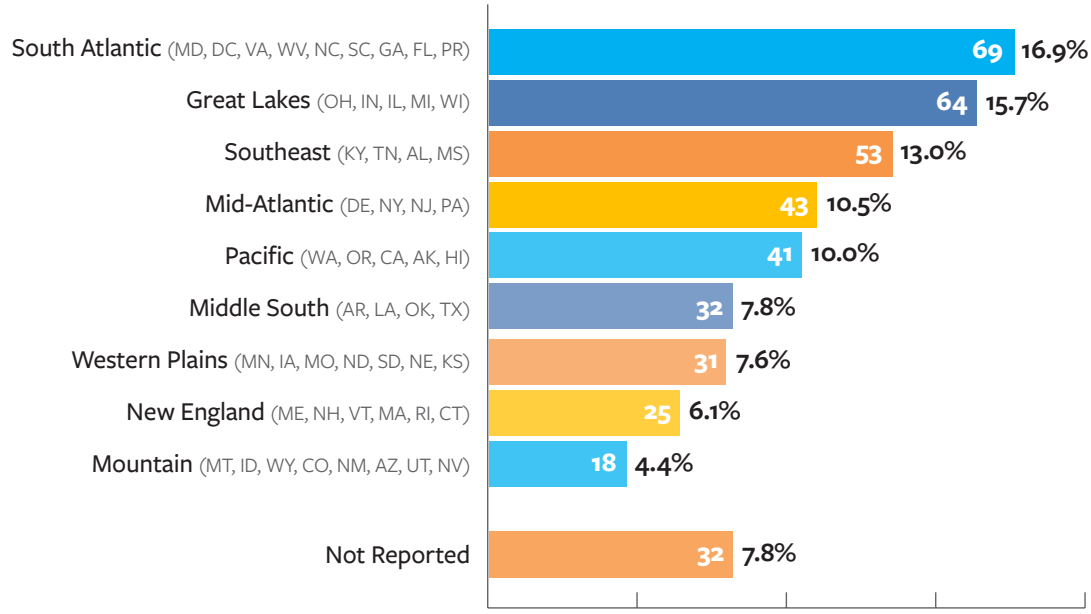


Figure 2

Type of Institution of Respondents

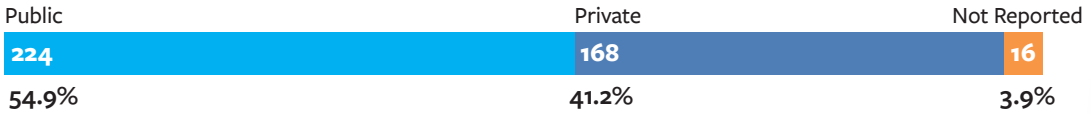


Figure 3

Gender of Respondents

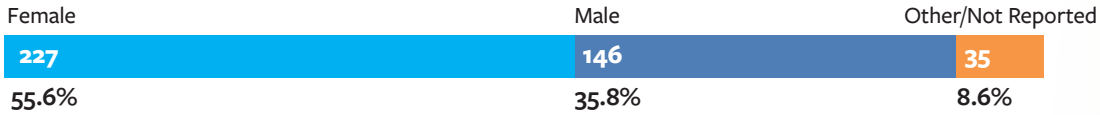


Figure 4

Number of Years Respondents have Worked in the Academy

Figure 5

Proportion of Respondents who are Pharmacists

Figure 6

Department or Division of Respondents

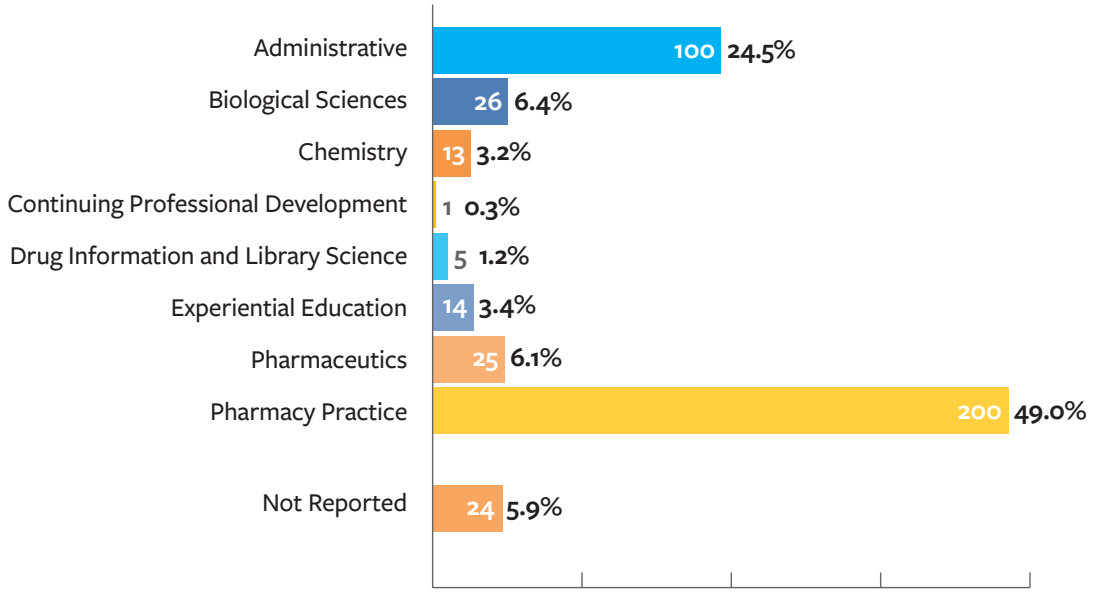
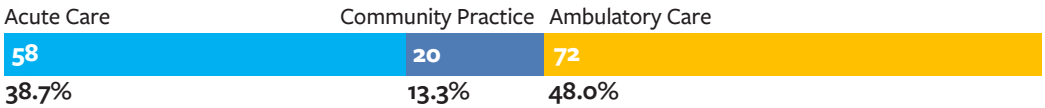


Figure 7

Practice Setting of Respondents who are Practice Faculty



the academic-practice interface with respect to influencing payment for services, shifts in the manner in which pharmacy practice is regulated, progression of learning from PharmD to residency training, educational initiatives intended to prepare practicing pharmacists for new opportunities, and the potential for expansion of continuing professional development approaches to practitioner development.

Finally, this year's Forecast report includes a section focused on the application of AI across practice, research and education. **Stuart Haines** and **Parisa Vatanka** guide readers through Forecast survey results and offer valuable commentary on themes related to AI that are likely to resonate with nearly all readers of this year's Forecast report.

Each section is accompanied by graphs summarizing the results of the Forecast survey. This report provides insight into the future of the pharmacy academy through the narratives of these exceptional leaders and their specific recommendations for colleges and schools of pharmacy.

How to Use the Forecast

This forecast is intended to provide reliable and innovative predictions that can be informative for proactive strategic planning. It is also designed to stimulate reasoned discourse that will enhance that planning in the academy at individual colleges and schools of pharmacy. As academics, we love a good debate, and this report should provide excellent fodder for dialogue across the academy. Considering the challenges we face, we cannot afford to be reactive with poor anticipation of what may lie ahead. This forecast (and, we anticipate, future Forecasts) is intended to augment our ability to achieve successful planning based on transformative views of what lies ahead.

With intentionality, the 2024–2025 Argus Commission selected a 5-year window for reaction to survey scenario statements. Strategic plans may be trending toward shorter overall plan lengths, generally in the range of 3–5 years. Taking those trends into consideration, the Argus Commission uses a 5-year window for forecasting. Similarly, it is important to consider there may be topics that are subject to abrupt changes in very short timeframes; in general, we refrained from considering these as part of the themed sections.

Best practices in strategic planning call for broad-based, grassroots stakeholder involvement. As this forecast can inform colleges and schools of pharmacy with our focus on the three "legs" of the academic stool, we encourage member institutions to share the report with all strategic planning participants—internally and externally. This will only strengthen those processes.

Given the importance of strategic planning in the current environment, a thorough implementation process with iterative evaluation and follow-up throughout the year should be considered. Individual colleges and schools of pharmacy are multi-faceted, complex organizations facing myriad difficulties related to population demographics, a political landscape that provides several challenges to higher education, and changes in health (notably, COVID-19) and health care in general. These challenges occur on a routine basis and must be evaluated in real time. Restricting strategic planning to only measuring outcomes, without considering potential changes that need to be included in the plan, may be shortsighted. Ongoing efforts to stay on top of our game are essential to

achieving desired outcomes. When faced with rapidly changing circumstances, this and future forecasts can be used during interim revisions of strategic plans and while making strategic decisions.

We cannot emphasize enough that rigorous discussion about the overall landscape of higher education and health care is essential to effective strategic planning. These forecasts may be used as tools to find common ground and areas of disagreement. It should also be noted that, while the authors for the various themes were thoughtful in the writing of their sections, disagreement with the report's conclusions and recommendations may occur. We welcome dialogue and encourage differing views and recommendations as part of the counter-perspective.

It is essential to continuously refine new processes, even those rooted in proven methods, over time. It is our sincere hope that this second edition of the forecast will aid and direct colleges and schools of pharmacy, as well as academy leadership, in their strategic planning. The next step beyond its creation is ensuring that the AACP Argus Commission Forecast 2025 be shared with all stakeholders involved in strategic planning. Undoubtedly, the ultimate value of this effort will hinge upon its integration into the planning process, potentially transforming the way we approach strategic planning.

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Financing the Pharmacy Education Enterprise

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Introduction

Faculty salaries, enrollment, experiential education, and new revenue sources, all of which impact the finances of colleges and schools of pharmacy, are explored in this survey.

Faculty Salaries

Faculty salaries represent a significant portion of the budget for colleges and schools of pharmacy. In the Argus Forecast survey, 63.1% of respondents believe it is unlikely that practice faculty salaries will increase substantially to align with market rates to ensure an adequate workforce (see Figure 8, Item 1). The US Bureau of Labor Statistics reports that pharmacist salaries range from $126,300 to $164,180, with a mean annual salary of $134,790, depending on the practice setting and region of the country.[1] According to the AACP 2023–2024 faculty salary survey, mean salaries for practice faculty are $120,571 (Assistant Professor) and $133,694 (Associate Professor).[2] Thus, many career pathways offer higher salaries than academia.

Given the current financial constraints of most colleges and schools of pharmacy, salaries are not likely to increase to align with market rates. In recent years, the attrition of pharmacy practice faculty has primarily been due to hospital clinical specialties and the pharmaceutical industry, which provide higher salaries and, for some, a more desirable balance of personal and professional lifestyle; additionally, since the COVID pandemic, these areas now allow for more remote work. While academic salaries may be less than the mean practice salary, benefits, such as time off for holidays and flexibility, may encourage individuals to stay in academia. Prescott et al conducted a survey to determine the prevalence and perceptions of remote work during the COVID-19 pandemic and recommended that schools evaluate allowing faculty to work remotely at least some of the time.[3] According to the National Bureau of Economic Research, US workers are willing to forgo up to 25% of their salary to work partially or fully from home.[4]

In response to the statement that contracts with practice partners at nearly all colleges and schools of pharmacy will offset at least 75% of faculty labor costs by providing clinical services at partner institutions, 77.7% of respondents believed this was unlikely (see Figure 8, Item 2). Clinical site partnerships often take the form of co-funded faculty positions. While this strategy can increase the number of faculty for a school, many co-funded faculty feel pulled in two directions. Despite having clearly articulated agreements, these faculty members often feel that both organizations expect 100% effort from them. They tend to burn out, become dissatisfied more quickly, and leave the academy. For practice partners to contract services without funding a specific faculty member,

schools need to hire the necessary faculty to provide services the practice site needs. These services must be reimbursable for practice sites to be willing to pay, which is likely only viable for ambulatory services. Thus, only a limited number of schools may provide contracted services.

The practice faculty placement model at sites has not changed much since the development of clinical pharmacy services in the 1970s to 1980s. Initially, colleges and schools of pharmacy needed sites, and sites needed pharmacists with advanced clinical skills but could not pay for them. The current environment is different. Large health systems that employ many pharmacists for direct patient care services no longer rely on schools to supply talent, especially for those pharmacists over whom they do not have complete oversight and accountability. Generally, many practice faculty are hired immediately after completion of their residency training. It is time to rethink the qualities of the individual who assumes a practice faculty position and how schools view and manage practice faculty. The model may differ for ambulatory versus acute care, large versus small health systems, and other practice settings. Reimagining the practice faculty member model may alleviate the financial pressures on colleges and schools and be a more effective educational model.

Experiential Education

While experiential education costs are a significant budget item, a majority of Forecast survey respondents (51.2%) believe it is unlikely that colleges and schools of pharmacy will not pay for IPPE and APPE rotations (see Figure 8, Item 3). Some colleges and schools of pharmacy may be paying for rotations because they cannot otherwise obtain the sites needed to meet accreditation standards due to competition in the region. The AACP 2023–2024 financial survey data indicates most colleges and schools of pharmacy are paying for some, if not all, of their rotations.[5] Due to workforce challenges, academic institutions are more frequently hearing concerns from experiential education host sites regarding the time required by pharmacists to engage in teaching activities, many of whom may feel overworked and that precepting students adds significantly to their workload.

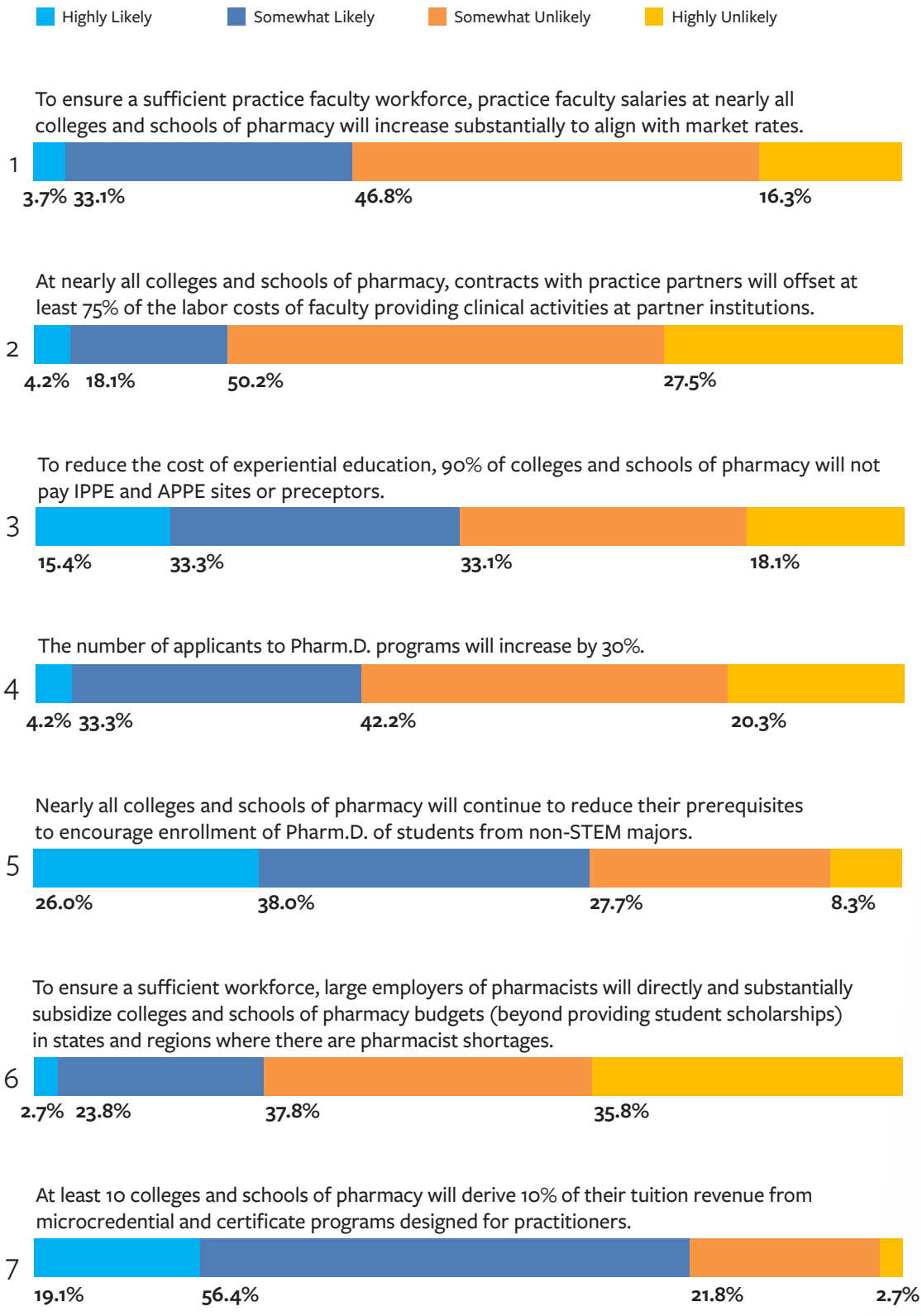
Enrollment

In the 2024 Forecast survey, 75.1% of respondents believed it was unlikely that the number of applicants to PharmD programs would increase by 30%.6 In comparison, there was a slight decrease this year, with 62.5% of Forecast survey respondents believing it was unlikely (see Figure 8, Item 4). This may reflect optimism with the small increase in applications for the 2023–2024 admission cycle.

Addressing enrollment challenges, 64% of respondents believed it was likely that nearly all colleges and schools of pharmacy would continue to reduce their prerequisites to attract non-STEM majors to pharmacy (see Figure 8, Item 5). Indeed, many colleges and schools of pharmacy have reduced the number of pre-requisites to stimulate applications from non-STEM majors and second-career individuals attracted to the diverse career options available to pharmacy graduates. This trend is likely to continue. With the reduction of STEM pre-requisites, many schools have adjusted the professional curriculum to ensure students have a firm foundation for advanced coursework. Non-science pre-requisites have been retained to fulfill general educational requirements. As pre-requisites

Figure 8

How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?



have become less reliable predictors of prior knowledge and their numbers decrease, pharmacy programs face the challenge of ensuring their students are academically prepared.

Potential Sources of New Revenue

Given declines in tuition revenue, the Forecast survey explored partnerships with large employers and the offering of microcredentials and certificate programs as potential sources of revenue.

While some employers provide student scholarships, only 26.5% of survey respondents believe it is likely that they would directly and substantially subsidize pharmacy program budgets in states and regions where there are pharmacist shortages (see Figure 8, Item 6). Workforce shortages are not new to pharmacy. As colleges and schools of pharmacy transitioned to the entry-level PharmD degree, a notable shortage of pharmacists emerged from the 1990s to the 2000s. Internships, sign-on bonuses, and generous relocation packages were used to entice new graduates. These strategies worked in the past and are likely to be effective when targeting regional shortages. However, the extent to which the current community pharmacy reimbursement environment will influence this previous recruitment practice is unknown. Additionally, this form of employment recruitment focuses on the downstream output of graduates and does not necessarily ensure upstream recruitment and admissions, upon which a school's financial success depends.

With regard to microcredentials and certificate programs, 75.5% of survey respondents believe that at least 10 colleges and schools of pharmacy will derive 10% of their tuition revenue from such programs (see Figure 8, Item 7). A 10% increase in total tuition revenue may be challenging in an environment that continues to emphasize a traditional continuing education (CE) model for maintaining licensure due to discounted CE tuition models and marketplace competition.[6] The value of microcredentials requires the buy-in of employers and some standardization.[7] It is likely that topics with national reach will need to be offered through established professional organizations that have learning management systems, infrastructure already in place, and some standardization for certificate programs. The niche for colleges and schools will likely relate to specialized topics that are the particular expertise of their programs or to relevant state-level regulations and practices that national organizations may not offer in their training.[8] Emerging discussions related to the integration of microlearning into the traditional pharmacy curriculum raise the possibility of leveraging microcredentials and certificate programs to boost enrollment and associated tuition.

Conclusion

While there are many strategies for how colleges and schools of pharmacy may improve their finances, the Forecast survey results indicate that a one-size-fits-all strategy may not exist. Each strategy has different challenges for implementation, and the circumstances of each college or school of pharmacy will likely determine the viable path forward for each institution.

Recommendations

1. Colleges and schools of pharmacy should work with employers to increase their support for student pharmacists in the form of scholarships, paid internships, and loan repayment programs for those who commit to working in pharmacist shortage areas after graduation.
2. AACP should encourage colleges and schools of pharmacy to reimagine the model for pharmacy practice faculty and offer training opportunities to position them to diversify and expand clinical revenue generation.
3. Colleges and schools of pharmacy should reevaluate the IPPE and APPE curricula to better define how program learning expectations can be met in ways that do not unnecessarily add additional burden to preceptor workload.
4. Colleges and schools of pharmacy should reevaluate the prerequisite competency areas of applicants, as well as find ways to ensure academic preparedness and maintain the rigor needed to prepare a competent pharmacy workforce.
5. Colleges and schools of pharmacy and AACP should proactively engage in discussions with national pharmacy organizations and major employers to establish a set of industry-accepted standards for microcredentials. This should include developing cost/revenue sharing templates that could be used in partnership with colleges and schools of pharmacy that contribute to the development and delivery of microlearning modules.

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Research and Graduate Education in Turbulent Times

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Introduction

Pharmacy research and graduate education are essential for scientific advancement and the development of future pharmacy leaders. Our research enterprise works globally to push the boundaries of current pharmaceutical knowledge, bringing to market new therapies and drug delivery systems, while also advancing pharmacy practice using evidence-based approaches. As outlined in our accreditation standards, integrating students into this rich scientific environment is not only key to our mission but also crucial to preparing them to be the next generation of leaders in pharmacy practice, as well as in research, industry, teaching, policymaking, and healthcare innovation.

It is important to note that the Forecast survey respondents included 24.5% from administration, 49.0% from pharmacy practice, and 4.6% from either experiential education or from drug information and library science. Thus, over three-quarters of respondents are likely to hold positions with relatively fewer research workload assignments. A larger sample of Forecast survey respondents actively engaged in research might have yielded different opinions on research and graduate education items, and this was taken into consideration in preparing this Forecast report.

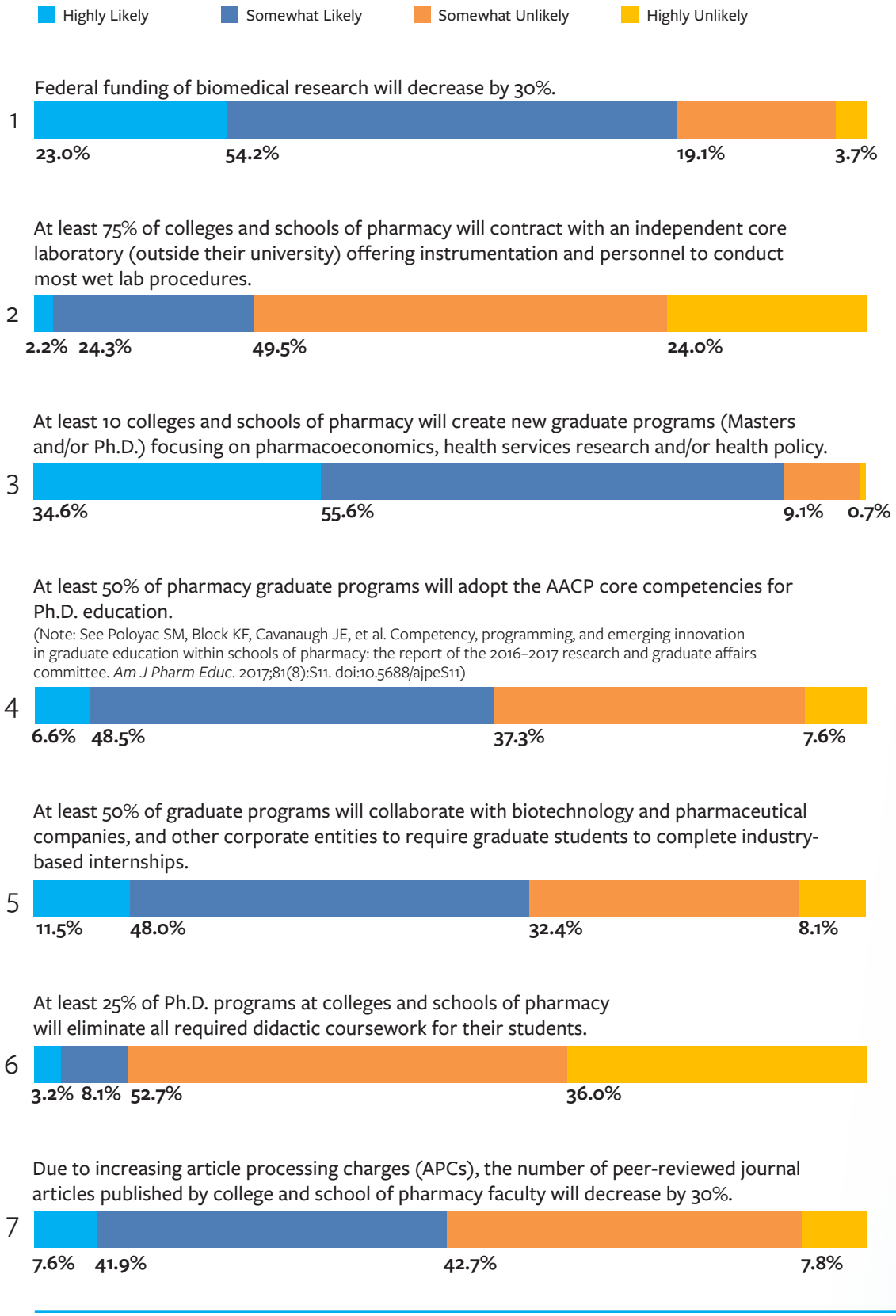
Threats to the Academic Pharmacy Research Enterprise

Despite the significance of academic pharmacy research, several threats could hinder the enterprise, thus impacting students' education and the reach of pharmacy research. Forecast survey respondents were asked about the future of federal funding for biomedical research last year and this year. In the AACP Argus Commission Forecast 2024, respondents were split, with 45.7% predicting that federal funding would decline by 30% within the next 5 years.[1] This year, 77.2% believed a reduction was likely to occur within the next 5 years (see Figure 9, Item 1). This year's survey was administered following the presidential election in November 2024 but prior to the inauguration and executive orders of the current administration, which may have influenced these results.

Changes in federal policies, particularly driven by executive orders from the White House, will likely lead to sustained reductions in federal funding of research, particularly from the National Institutes of Health (NIH). NIH budgets have been stagnant despite rising costs, and potential reductions in indirect costs will negatively impact the training environment. Additionally, executive orders resulting in visa restrictions are likely to negatively affect competitiveness in biomedical research.

Figure 9

How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?



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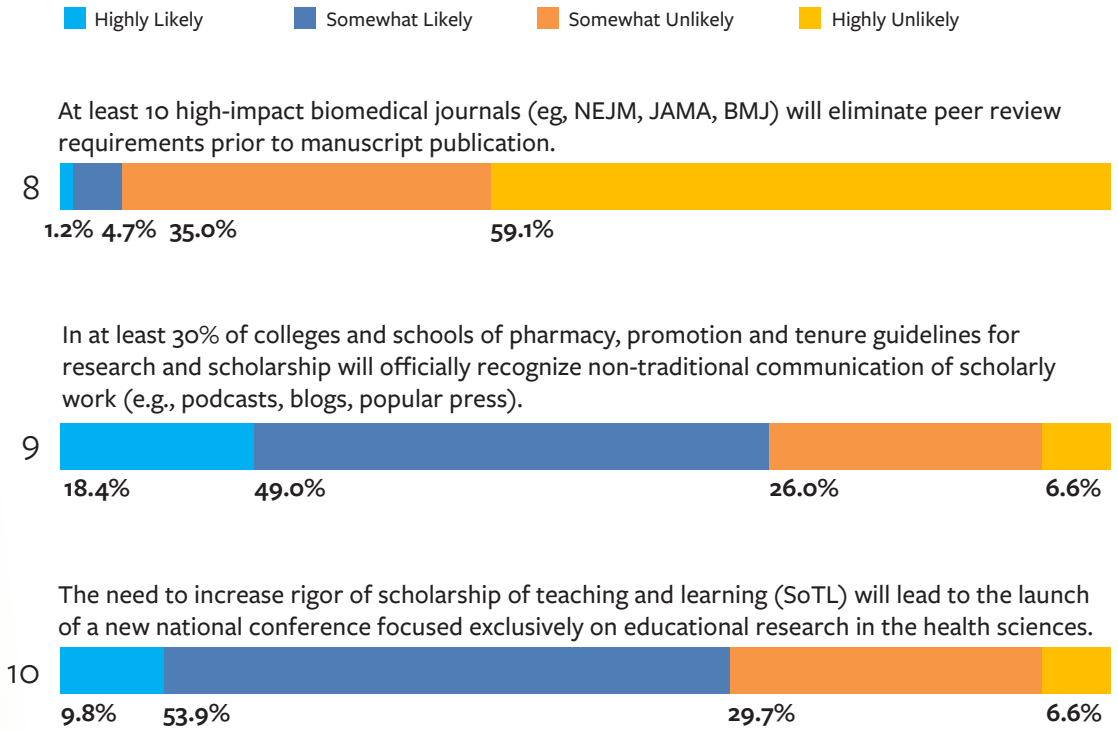

Public distrust in science[2] and declining perceptions of higher education[3] may lead to increased skepticism, especially regarding vaccines and drug pricing. Colleges and schools of pharmacy must effectively communicate the impact of pharmaceutical research to the public, policymakers, and the community to increase support and funding.

To address such challenges, diversifying research support and enhancing industry partnerships are essential. Colleges and schools of pharmacy may need to use external core laboratories for experiments, rather than investing in internal infrastructure (eg, individual or core laboratories). However, 73.5% of respondents felt this model was unlikely (see Figure 9, Item 2).

Graduate Education

Nationwide conferral of pharmacy master's degrees has risen from 385 in 1990 to 1536 in 2023.[4] Forecast survey respondents support colleges and schools of pharmacy creating graduate programs in pharmacoeconomics, health services research, and health policy (see Figure 9, Item 3). Many schools may have launched such programs to diversify revenue. Demand for graduates could be driven by the pharmaceutical industry, managed care, and health systems involved in value-based contracting, among others. Colleges and schools of pharmacy should explore master's programs amidst evolving environments and seek collaboration with academic, corporate, and nonprofit research entities, especially given the changing role of AI.

As opportunities for new graduate program focus areas develop, the way graduate education is delivered should also change. Similar to the results of the 2024 Argus Commission Forecast, this year's respondents remained doubtful about adopting AACP Core Competencies for PhD education[5] (see Figure 9, Item 4). Graduate faculty likely align programs with needs by consulting industry and academic experts, and those leading pharmacy graduate programs may not seek AACP guidance. Highlighting the transformative benefits of implementing AACP Core Competencies for PhD education could drive meaningful improvements. Most faculty may not fully realize that PhD programs should be competency-based in addition to being time-dependent, and progress in this area is needed.

A competency-based approach to PhD education would enhance flexibility and facilitate industry internships as part of the curriculum. Respondents largely support collaboration with corporate partners, with 59.5% indicating that the development of partnerships is somewhat or highly likely (see Figure 9, Item 5). Many colleges and schools of pharmacy with training grants may require this, but not all have convenient access to pharmaceutical industry partners. Those unable to establish such relationships might consider alternatives, such as the animal health industry, contract research organizations, or nonprofit research organizations.

To increase PhD curricula flexibility and adopt competency-based approaches, consideration should be given to a "European" model of graduate education. While European undergraduate programs are often longer than those in North America, their biomedical science PhD programs are often shorter.[6] However, 88.7% of respondents believed it was unlikely that 25% of programs would eliminate all didactic coursework (see Figure 9, Item 6). Despite this finding, identifying opportunities to eliminate or reduce some coursework, as in many European programs, would be desirable.[7]

Dissemination of Research Findings

The Forecast survey explored respondents' views on the future of research publication over the next 5 years. Respondents were divided on whether journal article output would decrease in pharmacy schools due to article processing charges (see Figure 9, Item 7). Publications might drop if federal research support continues to decline. Although Einstein published seminal work without rigorous peer review[7], respondents did not believe that at least 10 high-impact journals would eliminate peer review (see Figure 9, Item 8). However, 67.4% of forecast survey respondents thought it somewhat or highly likely that 30% of colleges and schools of pharmacy would recognize non-traditional communication, such as podcasts and blogs, in the context of promotion and tenure guidelines (see Figure 9, Item 9). This could be an opportunity for AACP to use its learning management system to help faculty disseminate creative work, particularly since all pharmacy faculty can now access AACP resources under the new open individual membership model.

Conclusions

Collectively, our academy's research and graduate education enterprises continue to make a significant impact on the health and well-being of our country and our world. Yet we have never before experienced the vast array of serious threats and challenges as we do in today's climate and in what lies ahead. We are at an inflection point and, now more than ever, we need to find better ways to work together—across our institutions and with industry and other partners—to strengthen our research and discovery enterprise and graduate programs.

Recommendations

1. AACP should identify and implement new strategies to attract scientists from AACP member colleges and schools of pharmacy to their annual meeting to help support the pharmacy research enterprise and graduate programs.
2. AACP should increase the engagement of researchers in academic pharmacy's efforts to advocate for research funding and build public awareness of the critical importance of science.
3. Colleges and schools of pharmacy should identify alternative funding sources and share best practices for using resources efficiently. Partnerships with industry, non-profits, and foundations should be enhanced to advance research and support student learning.
4. Colleges and schools of pharmacy should explore new master's programs that align with evolving research needs and opportunities, particularly in academic, corporate, and nonprofit sectors, with a focus on areas such as AI.

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Supporting Students to Achieve Academic, Personal, and Professional Success

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Introduction

Student success is increasingly important due to perceptions that students entering colleges and schools of pharmacy today are not as prepared for the rigor of the PharmD program. Contributing factors may include wider learning gaps arising from the COVID-19 pandemic, higher prevalence of mental health conditions, and reduced barriers to entry (eg, eliminating PCAT and reducing prerequisites). Technological advancements coupled with AI have the potential to allow individualized instruction, thereby supporting students who would benefit from additional practice and guidance. Similarly, such advances may enable students to progress more rapidly through a competency-based curriculum. Data from the Forecast survey indicates the academy is ready for change in some areas and hesitant in others.

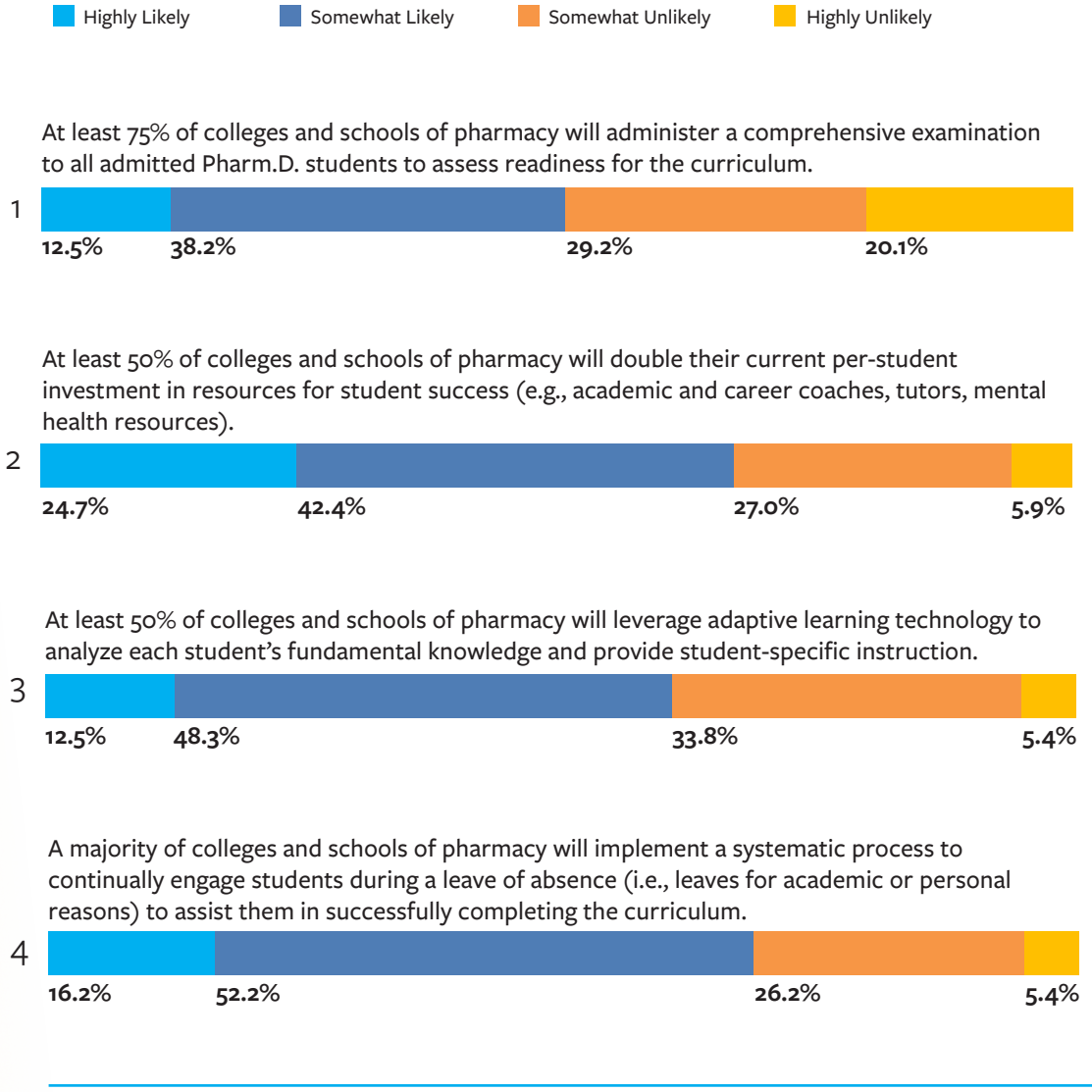
Student Success

Previously, standardized knowledge assessments (eg, the PCAT) were routinely used in admissions to determine if a student was sufficiently prepared for the professional degree program. While standardized tests clearly have limitations and have been criticized as biased, well-constructed admission tests have predictive validity and enable colleges and schools of pharmacy to select candidates who are likely to succeed academically.[1] Standardized tests have fallen out of favor, and as colleges and schools of pharmacy relax admission requirements to attract applicants, they are infrequently required as part of the admissions process. As more students are struggling to meet the demands of a rigorous program, colleges and schools of pharmacy have made significant investments in student success programs. Similarly, many programs have noted increasing incidents of professionalism lapses, and some have employed strategies to address these behavioral problems.[2,3] Standardized approaches to identify individuals with outstanding psychosocial skills (eg, administering a situational judgment test) are routinely used by employers to make hiring decisions.

Perhaps the best use of standardized tests is not to make admission decisions but rather to identify learners who need extra support through targeted interventions. When asked about the likelihood that "readiness" assessments would become the norm, respondents to this year's Forecast survey were ambivalent (see Figure 10, Item 1). This may be driven by a perceived lack of value relative to the effort to create and validate these assessments. Moreover, there is insufficient data to support the notion that a readiness assessment combined with targeted interventions can preemptively improve student success. This is a ripe scholarly question that AACP could address by tapping into the expertise of member institutions and systematically collecting data.

Figure 10

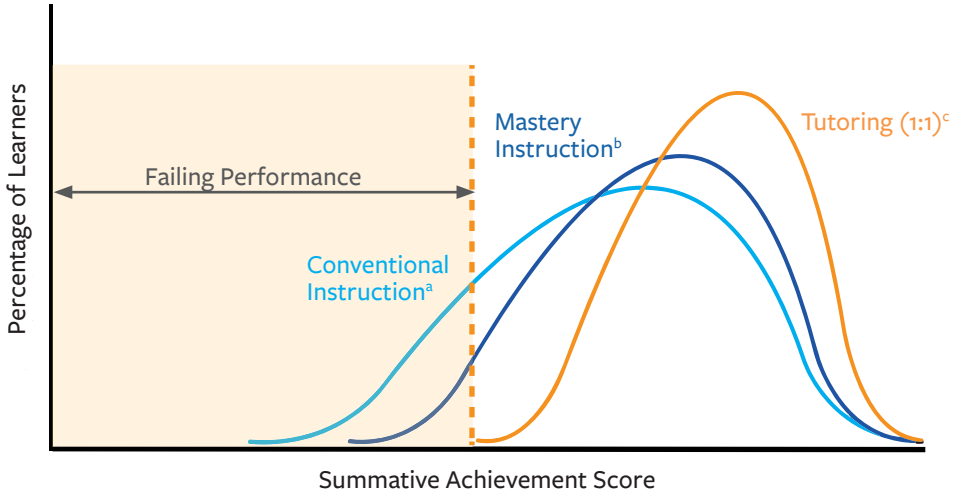
How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?



Most respondents (60.8%) agreed that colleges and schools of pharmacy will invest in adaptive learning technologies to provide customized instruction to address individual student needs (see Figure 10, Items 2 and 3). Such technologies could potentially address "the 2-sigma problem," reducing the wide disparities in student performance, as described by Benjamin Bloom (see Figure 11).[4] It has been well-documented that tutoring and individualized instruction, coupled with ongoing formative feedback, significantly improve student performance and have a disproportionately beneficial effect on struggling students. Indeed, high-quality tutoring has the largest documented effect size of any educational intervention.[4] However, one-on-one tutoring is expensive and cannot be provided at scale. Thus, only a fraction of students receive one-on-one tutoring, even though most would benefit. Moreover, since there is a social stigma associated with the need for tutoring, many students are reluctant to seek or receive additional help. Adap-

Figure 11

Achievement Distribution for Students Under Different Instructional Conditions



[a]Instruction with periodic, formative feedback to group
[b]Instruction with regular, individualized formative feedback
[c]Individualized Instruction with ongoing formative feedback

tive learning technologies, now supported by AI, have the potential to provide customized instruction to all students at a substantially lower cost. To date, adaptive learning technologies have not consistently demonstrated significant benefits, but most studies were conducted prior to the availability of AI that can autonomously analyze and adjust instruction to match individual student motivations and needs.[5,6]

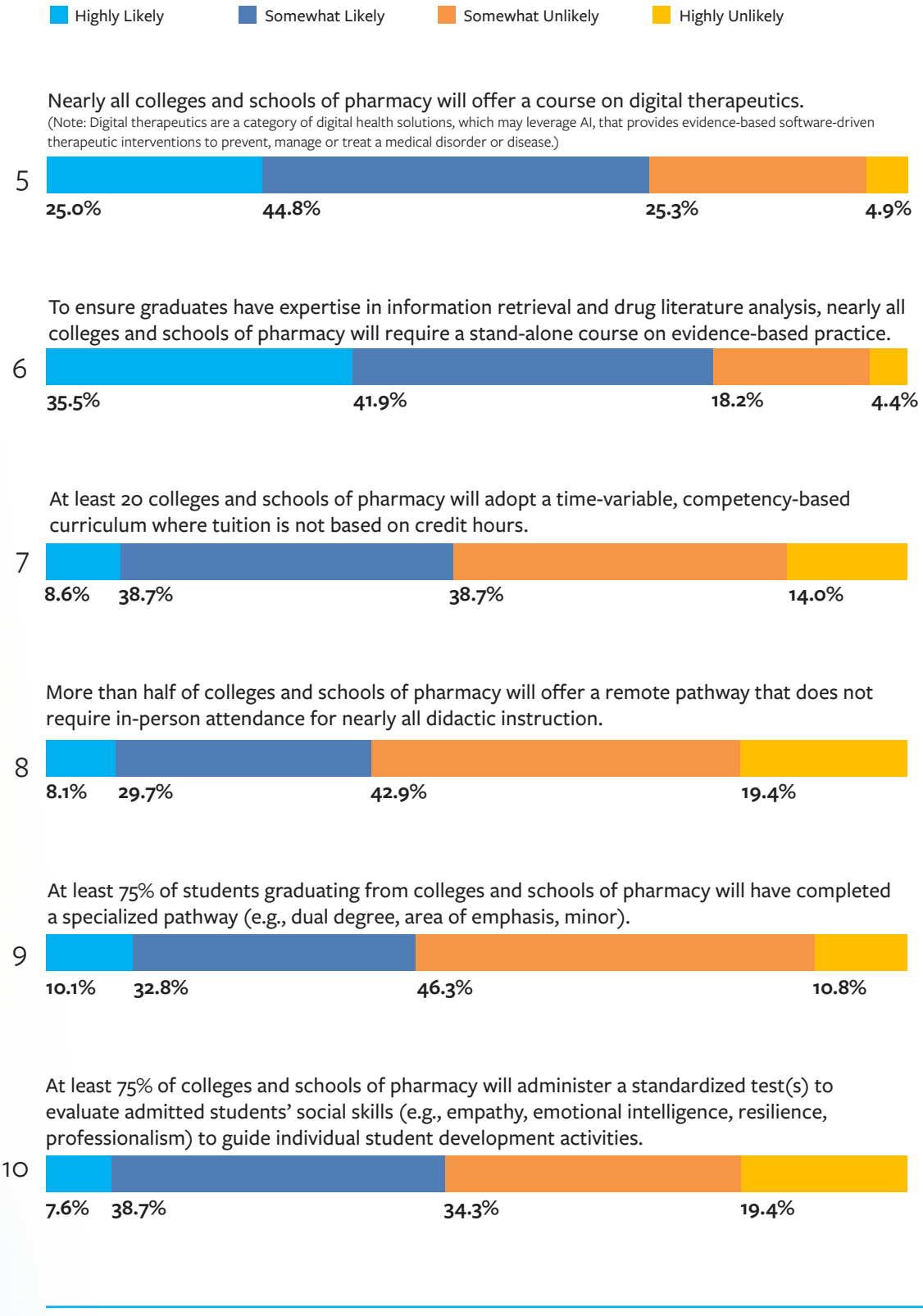
Students who take a leave of absence, either for academic or personal reasons, are far less likely to graduate. At most institutions, students on leave are unable to participate in student activities, cannot access instructional materials, and do not receive regular "check-ins" from student success staff, because they are no longer officially enrolled or paying tuition. Students are effectively "cut off" from the college or school of pharmacy. A significant majority of Forecast survey respondents (68.4%) believed that most colleges and schools of pharmacy would implement systematic processes to engage students on leave to prepare them for a successful return (see Figure 10, Item 4). To our knowledge, data regarding the benefits of targeted interventions for pharmacy students granted a leave of absence have not been published, and this is an area where additional scholarship is needed.[7]

Curricular Innovations

AI is changing information delivery, retrieval, and analysis, but it can provide erroneous and biased responses. Notwithstanding, generative AI models are rapidly improving, making significant leaps in capability.[8] Students must learn to effectively use the output from AI-enabled tools to make therapeutic decisions, as well as select appropriate digital therapeutic tools to complement pharmacotherapy. Results from the Forecast survey in-

Figure 12

How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?



dicate that the majority of respondents believe it is somewhat or highly likely that nearly all colleges and schools of pharmacy will offer a course in digital therapeutics (69.9%, see Figure 12, Item 5) and that a stand-alone course on evidence-based practice will be needed to ensure graduates have expertise in information retrieval and drug literature analysis (77.4%, see Figure 12, Item 6).

Interest in competency-based education (CBE) models is growing; however, significant logistical barriers to implementation remain.[9,10] There was a notable shift in this year's Forecast survey, as more respondents believe that, in the next 5 years, 20 colleges or schools of pharmacy will adopt a time-variable CBE curriculum where tuition is not based on credit hours (2024, 39.4% highly or somewhat likely; 2025, 47.3% highly or somewhat likely, see Figure 12, Item 7). This shift suggests that technological advancements increase the perceived feasibility of implementation. Theoretically, CBE would be structured to provide individualized instruction and feedback to each learner. In a CBE model, faculty would no longer focus on information delivery but would spend far more of their time assessing student performance and providing feedback.

Despite the broad implementation of remote learning during the COVID-19 pandemic, most faculty prefer in-person instruction. A majority of Forecast survey respondents indicated it was unlikely that more than half of colleges and schools of pharmacy would offer remote learning that does not require in-person attendance for nearly all didactic instruction (see Figure 12, Item 8). Nonetheless, there are substantial benefits to online, remote delivery of instruction, particularly for knowledge acquisition, which can be delivered at scale. Well-designed, technology-enabled instruction can be highly engaging and effective.[11] Faculty may be able to shift their efforts toward smaller group learning, providing tailored feedback to learners during activities that develop problem-solving, critical thinking, and clinical reasoning skills more effectively.

Students desire to differentiate themselves, and pathways are one approach to support some specialization before graduation. Forecast survey responses indicate the academy is split on their belief that 75% of graduating students will complete a specialized pathway (see Figure 12, Item 9). It is important to note that specialized pathways can be structured in various ways. Most institutions could implement lower-resource options (eg, microcredentials, certificate programs, digital badges) in the short term, whereas dual degree programs would require considerably more time, coordination, and instructional resources.

Conclusion

The 2025 Forecast underscores the need for a multifaceted approach to supporting student success, encompassing not only academics but also personal well-being and professional readiness. By strategically investing in technology and evolving curricular models, pharmacy education can better equip students for the challenges ahead.

Recommendations

1. AACP should develop or license standardized "readiness assessments" for member institutions to use that characterize a student's preparedness for the curriculum. These assessments should not only identify gaps in knowledge and aptitude but also the psychosocial skills needed to be successful in pharmacy practice.
2. AACP should advocate for the adoption of competency-based education models whereby colleges and schools of pharmacy develop and document student achievement of professionally defined competencies at appropriate milestones to determine each student's progression.
3. AACP and member institutions should partner to develop and maintain remotely delivered learning materials (eg, online video tutorials) focused on the foundational knowledge common to all PharmD curricula, freeing faculty to implement instructional activities that foster skill development, provide learner-specific feedback, and create competency-based assessments.
4. AACP member institutions should provide mechanisms to students to earn specialty credentials (eg, certificates, pathways, minors, and dual degrees) in clearly defined areas of knowledge or practice; these credentials should include both didactic and experiential components.

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Shaping the Future of Pharmacy: Advancing Practice Through Advocacy, Collaboration, and Education Transformation

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Introduction

The practice of pharmacy is in a period of disruption with rapid changes occurring. The traditional, product-driven payment model is no longer viable, making it imperative for practice transformation. The public has benefited from patient care provided by pharmacists, most notably since the onset of the COVID-19 pandemic, in the form of vaccinations, testing, and, in some cases, treatment. The growing shortage of primary care practitioners and prescribers nationwide further adds to the need. Now is the time for transformation and advancement of pharmacy practice to one focused on provision of medication-related patient care.

This year's Forecast survey identified two key themes that are critical to influencing positive change within the future of pharmacy practice: fostering more rapid uptake of expanded scope of practice and payment for pharmacists' services, and amplifying workforce development to meet contemporary needs of patient care delivery. Pharmacy organizations, along with colleges and schools of pharmacy, must embrace actively collaborating with our practice colleagues to lead efforts to advance practice.

Fostering Rapid Evolution of Scope and Payment for Pharmacist Services

Sixty percent of survey respondents acknowledged that Federal provider status is likely in the next 5 years (see Figure 13, Item 1). Individual states have already enacted legislation that has expanded pharmacists' scope of practice; health payors have enabled pharmacists to be paid to some extent for patient care services in nearly every state, while 5 states have passed standard of care pharmacy practice language affording pharmacists to

practice at the top of their clinical ability.[1,2] As of 2024, 36 states have supported pharmacists for patient of services through either legislative or regulatory changes[3], yet the uptake of pharmacist billing for services has been limited.

It is clear that the public needs and expects pharmacists to provide expanded medication-related care. ACPE standards require colleges and schools of pharmacy to ensure that students are practice-ready and prepared to utilize contemporary service payment models for services rendered.[4] Academia has a critical leadership role in directing change, engaging current pharmacists and their employers to implement and evaluate advanced care models, and advocating for nationwide practice expansion. Pharmacist provision of patient care services is possible within any scope of practice where payment contracts have been designed with payors.

Patient care payment models are evolving in health care, including pharmacy practice. Sixty-one percent of survey respondents agreed that colleges and schools of pharmacy will facilitate partnerships between health plans and pharmacy providers to create and advance value-based payment models for services (see Figure 13, Item 2). To promote this, colleges and schools of pharmacy should consider dedicated faculty leadership to support advocacy for Federal provider status and the advancement of state scope of practice. This can be achieved by actively engaging students, faculty, and alumni at state legislative days and connecting with state and Federal legislators, in addition to participating in national pharmacy association advocacy efforts.

Sixty-seven percent of survey respondents thought it was highly or somewhat likely for at least 25 states to adopt a "standard of care" regulatory mode for pharmacy practice (see Figure 13, Item 3). At the time of writing, 5 states (Idaho, Iowa, Vermont, New Mexico, Alaska) had adopted some version of "standard of care" regulation, that holds pharmacists accountable to provide care at a level that is consistent with their education, training, experience, rather than requiring specific authority to perform defined tasks. While adoption of standard of care practice models is likely to take time, this early uptake emphasizes the pressing need for colleges and schools of pharmacy to prepare all graduates to be advanced practice ready.

Adapting the Environment and Workforce to Facilitate Practice Transformation

The ability to transform practice requires not only adapting the current infrastructure, but also adequately preparing current and future pharmacists. Only 43% of respondents thought it was likely that accreditation agencies would create aligned professional competencies through the PharmD program to post-graduate training, practice, and board certification (see Figure 13, Item 4). Key elements of contemporary practice, such as prescribing, diagnosing, medical billing, advocacy, and personnel management, require both development and maintenance of competency. While the curricula of colleges and schools of pharmacy include required didactic elements based on ACPE standards, there is no standardized approach to assessing competency. This absence of standardization limits the opportunity for a seamless transition and progression to competencies outlined for postgraduate training, practice, and credentialing.

Figure 13

How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?

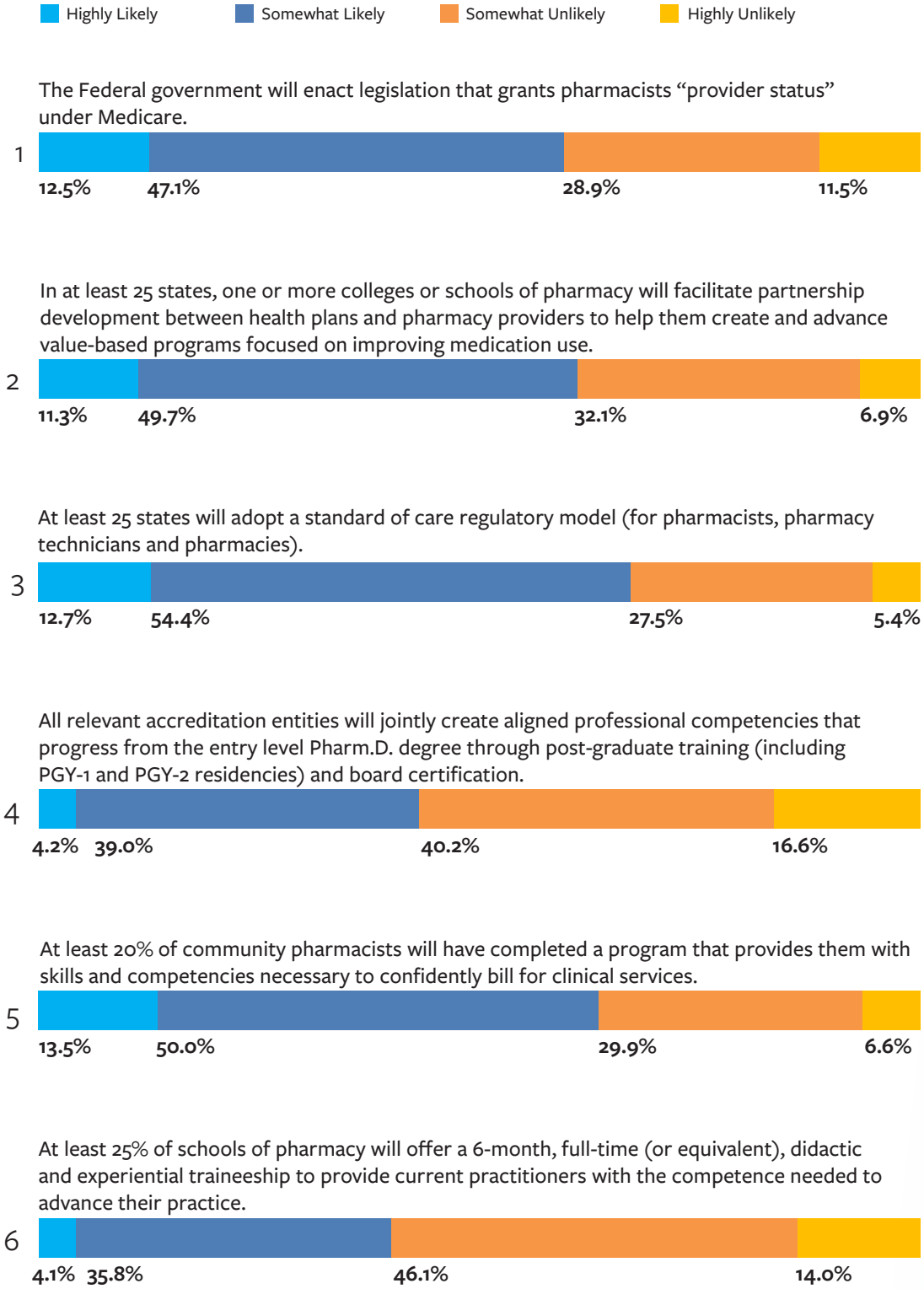
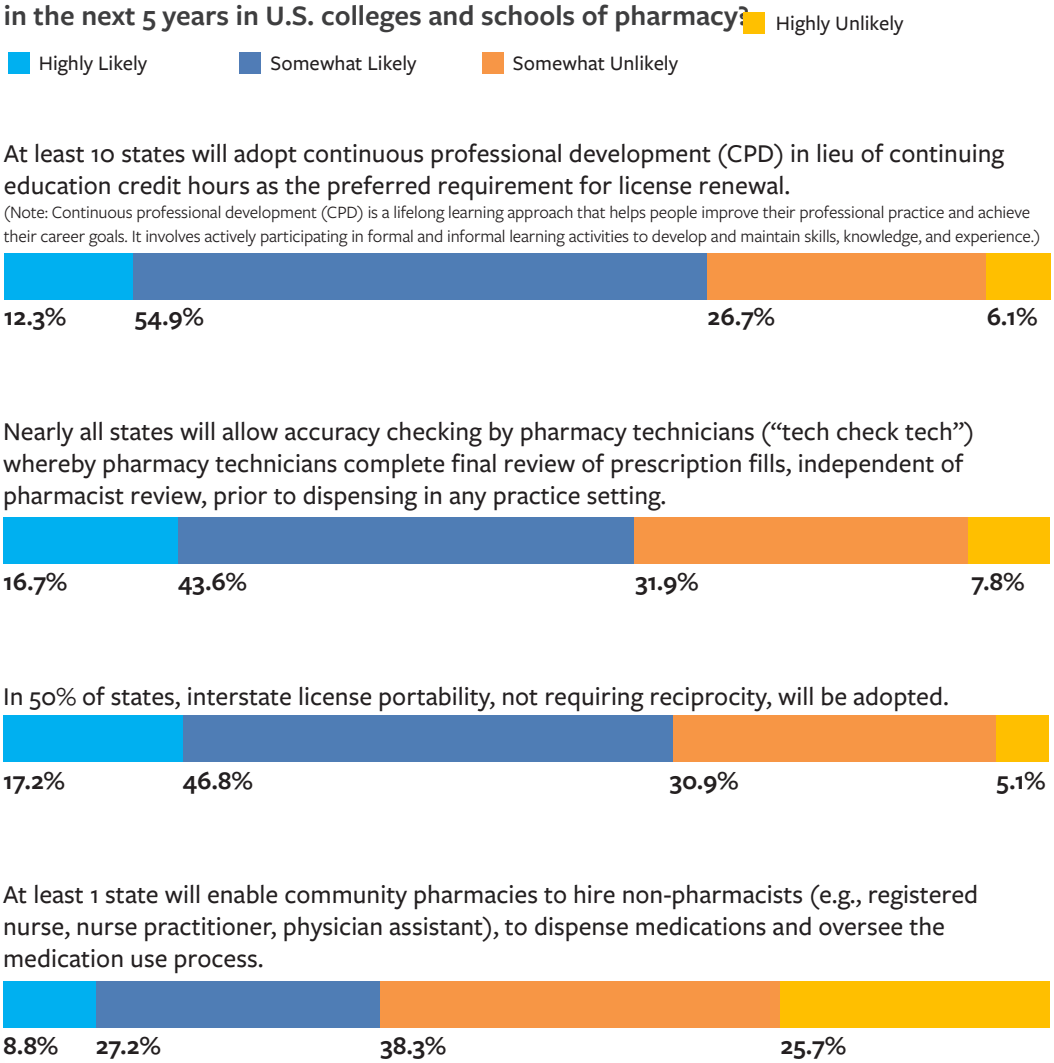


Figure 13

How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?



Approaches to alignment would be to first re-envision the PharmD training model to focus more on the use of competency-based education (CBE). This approach has been described in recent AACP committee reports and reviews.[5,6] Incorporating CBE will take time and require programs to commit to innovation and lead efforts in establishing best practices for delivery and assessment. This will lay a solid foundation for PharmD graduates to enter the dynamic workplace environment, facilitate alignment with and continued development of competencies required for postgraduate residency and practice, and require a joint effort among colleges and schools of pharmacy and stakeholder organizations within the profession to develop consistent terminology, definitions, and a framework for use of a competency-based approach across the spectrum of training and practice.[7] Information sharing and collaboration through organizations with wide representation, such as the Joint Commission of Pharmacy Practitioners (JCPP), is critical for success.

Investing in the current workforce to develop the necessary competencies for contemporary practice is critical. While many states have established mechanisms for billing and payment for services, only 63% of respondents felt that 20% of community pharmacists will have completed a program focused on medical billing (see Figure 13, Item 5). Additionally, 60% of respondents say that it is unlikely that 25% of schools will offer a 6-month (full-time) or equivalent for training practicing pharmacists on the delivery of advanced services (see Figure 13, Item 6). There are opportunities for organizations to develop initiatives and partner with colleges and schools of pharmacy, employers, and state organizations in training the current workforce in emerging areas. The AACP Transformation Center is a recent example. Utilizing the expertise of colleges and schools of pharmacy to optimize the structure, delivery, and duration of training programs will hopefully reduce barriers to participation, leading to a larger percentage of the current workforce achieving competency. Likewise, every college and school of pharmacy has students at experiential learning sites who can help educate preceptors to gain a deeper understanding of contemporary practice needs and issues.

Sixty-seven percent of respondents felt it was likely that 10 or more states would have adopted Continuing Professional Development (CPD) in lieu of continuing education requirements within the next 5 years (see Figure 13, Item 7). To ensure the ongoing maintenance of knowledge and skill competency, adopting CPD as the method for licensure renewal could support practice advancement through meaningful reflection and intentional planning.[8] Many colleges and schools of pharmacy are beginning to incorporate the concept of CPD into their curricula, and CPD is now incorporated into the Board of Pharmacy Specialties recertification process. Adoption of widespread use may take time; however, educational institutions must advocate for the adoption of CPD and work toward creating a culture of continuous learning to meet the evolving needs of practice within the profession. Pharmacy organizations, along with colleges and schools of pharmacy, can play a critical role in educating the workforce on the CPD process by working closely with ACPE to become providers of accredited CPD programs.

Conclusion

Transformation of pharmacy practice is at a critical juncture. The collaborative efforts of colleges and schools of pharmacy, professional organizations, regulatory and credentialing bodies, and our practice partners is essential. The survey highlighted the many areas where colleges and schools of pharmacy, along with AACP, can lead these efforts alongside our practice partners. To meet patient needs in the dynamic health care environment, pharmacy practice must advance.

Recommendations

1. Each college and school of pharmacy must incorporate learner instruction regarding principles of payment for patient care services.
2. Each college and school of pharmacy should support student, faculty, and alumni engagement in state and national efforts to establish legislative policies that support pharmacists' opportunities to serve the medication needs of patients and their communities.
3. AACP should lead efforts in partnership with each of the Joint Commission of Pharmacy Practitioners (JCPP) organizations focused on developing initiatives that increase pharmacist engagement in pharmacy associations to enhance advocacy and practice advancement within the profession.
4. AACP and each college and school of pharmacy should collaborate with external stakeholders, such as health plans and self-insured employers, to identify, develop, and offer programs to prepare the current workforce for pharmacy practice transformation.
5. Each college and school of pharmacy should develop curricula that incorporate the CPD model to prepare graduates for a career of lifelong learning. AACP should assist colleges and schools of pharmacy in promoting the CPD model to the current workforce as the optimal learning approach to maintain professional competency and licensure. AACP, along with some colleges and schools of pharmacy should participate in the new CPD education format offered by ACPE.
6. Colleges and schools of pharmacy are strongly encouraged to consider the role of competency-based education at their institution and assess its feasibility for implementation.

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Artificial Intelligence Will Be an Integral Partner In Transforming Pharmacy Practice, Research, and Education In the Next 5 Years

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Introduction

The use of computing devices to perform complex tasks like reasoning, decision-making, creating, and communicating with humans is advancing exponentially. While some forms of artificial intelligence (AI) and machine learning have existed for decades, the latest technology is now able to perform cognitive work that, until the recent past, only humans could do. These tools are already having a profound impact in the workplace. Generative AI is now able to produce responses in the form of text, audio, images, or video from almost any human-provided prompt. The quality of these responses has continually improved as the engines (eg, large language models, or LLM) that drive AI tools learn from their previous interactions with humans and other machines. Agentic AI, which is currently in its early stages, uses data to make autonomous decisions. Agentic AI can function with little human oversight, working across applications to complete multi-step tasks, adapting to changing conditions, and setting subgoals based on user needs. Physical AI, when fully developed, will be able to perceive and interact with the physical world. Coupled with Generative AI and Agentic AI, Physical AI can take action in digital and physical environments to achieve predefined objectives.

While there is tremendous excitement about the potential benefits that AI affords humanity, there is also considerable trepidation.[1] AI may be a destructive force, competing for jobs and reducing the need for humans, including educators and health professionals. Conversely, AI may become a partner, enabling us to achieve more, both quantitatively and qualitatively. While uncertainty remains, the 2025 Forecast survey considered the impact AI might have over the next 5 years.

AI as a Partner in Clinical Practice

As a society, we have become accustomed to rapid access, convenience, and personalized experiences in many aspects of our lives, from banking to shopping, music, and travel. Rapid advances at the intersection of healthcare and technology, known as digital health, have emerged with the promise of bringing these same elements to health care.[2] According to the Food and Drug Administration (FDA) Digital Health Center of Excellence, the aim of digital health technology is to reduce inefficiencies, improve access, reduce costs, and enhance quality, in addition to making health care more personalized.[3] Examples

of these technologies include health apps, wearable devices, telehealth, sensor-enabled medications, digital diagnostics, and digital therapeutics.

AI-enabled digital health technologies have the promise of breaking down silos and existing hierarchies and serving as a partner in practice, from clinical decision support to workflow optimization. Rather than waiting for an individual to present with an illness, health professionals can meet individuals within the context of their lives, needs, and preferences. Patients will increasingly have agency with real-time, actionable insights and guidance to self-manage their health, twenty-four hours a day, seven days a week, outside traditional healthcare settings. Indeed, many patients already use AI-enabled tools for a wide range of health-related needs.

Despite the rapid adoption of AI solutions in many fields, the majority of respondents to the Forecast survey believe it is somewhat or highly unlikely that 75% of patient encounters and medication education will be delivered by AI within the next 5 years (see Figure 14, Item 1). However, the nature of pharmacist-patient encounters and medication education is poised to change very significantly and may reach a tipping point sooner than expected. Early adopters of care models that integrate remote patient monitoring and AI-driven predictive analytics with timely action by the health care team are already realizing greater harmonization of in-person and virtual care visits, with an emphasis on prevention, early detection, and patient empowerment.

Opinions were mixed regarding the likelihood that drug dosing decisions will be determined by AI in 50% of hospitalized patients in the next 5 years (see Figure 14, Item 2). In January 2025, federal legislation was proposed to allow AI and machine learning technology to autonomously prescribe FDA-approved drugs.[4] This is likely to become a standard of practice, and, eventually, it will be considered malpractice not to use these tools as a partner in making drug selection and dosing decisions.

AI as a Partner In Research

AI is transforming pharmaceutical research by acting as a helpful partner in formulating research protocols, analyzing data, and conducting in silico experiments using digital twin technology.[5] The Forecast survey data documents a growing consensus regarding AI's expanding role in pharmaceutical research. A majority of Forecast survey respondents agree that AI simulation and molecular modeling will replace at least 25% of traditional wet lab experiments in colleges and schools of pharmacy in the next 5 years (see Figure 14, Item 3).

Moreover, the majority of Forecast survey respondents believe that at least 50% of experimental protocols and grant applications will be written by AI in the near future (see Figure 14, Item 4). AI's role in research protocol development is accelerating timelines at a pace that was inconceivable until now. AI technologies are likely to become indispensable partners during every phase of the research process in the next 5 years, from idea generation to protocol development, grant applications, in silico experiments, data analysis, presentations, and publications.

Figure 14

How likely is it that the following conditions or circumstances will occur in the next 5 years in U.S. colleges and schools of pharmacy?

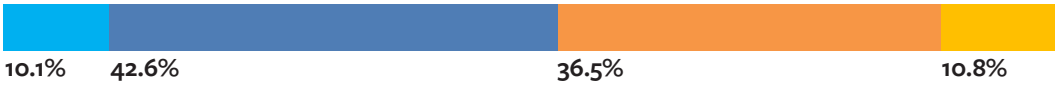
AI In Practice

In 75% of patient encounters, medication education will be primarily delivered by artificial intelligence.

1

In 50% of hospitalized patients, drug dosing decisions will be determined by artificial intelligence.

2



AI In Research

Artificial intelligence simulation and molecular modeling will replace 25% of traditional wet lab experiments in colleges and schools of pharmacy.

3

At least 50% of experimental protocols and grant applications will be written by artificial intelligence.

4

AI In Education

Extensive use of artificial intelligence by students will contribute to the national NAPLEX pass rate falling to below 50%.

5

To reduce faculty workload, at least 50% of colleges and schools of pharmacy will mandate that faculty use artificial intelligence to provide feedback to students on all ability-based assignments and assessments.

6

AI as a Partner In Education

The potential for AI to serve as a partner in improving both teaching practices and learning behaviors has been widely acclaimed.[6] AI can be used to create instructional materials, design assessments, provide learner feedback, and analyze student performance to deliver personalized instruction. However, there is some evidence that ineffective applications of AI may reduce desirable difficulty during the learning process and thus diminish, rather than enhance, human capabilities. Despite the increasing use of AI by student pharmacists, nearly 70% of respondents believe it is unlikely the national NAPLEX pass rate will fall below 50% in the next 5 years (see Figure 14, Item 5).

Faculty are often deeply rooted in traditional approaches to teaching and learning and may not choose to use AI in their work beyond generating instructional materials. Forecast survey respondents were, again, skeptical (75% disagreed) that colleges and schools of pharmacy would require faculty to use AI tools to reduce workload and improve feedback to students (see Figure 14, Item 6). The potential benefits of AI may remain untapped by the pharmacy academy in the absence of leadership and a pioneering mindset. Given that learning requires struggle, students, left to their own devices, are unlikely to use AI in ways that enhance their learning.[7] Thus, faculty with expertise in the effective use of instructional AI will be needed to select, design, implement, and test AI tools.[8]

As AI technologies become commonplace in practice, pharmacy graduates will not only need to be proficient users of these tools but also knowledgeable about their strengths and limitations. Students, residents, and current practitioners will require training and first-hand experience evaluating AI-generated data, ensuring its accuracy, and determining its clinical application. There are also ethical concerns about the use of AI, and faculty will need to teach learners how to address potential biases and patient privacy concerns. Learning how to proficiently integrate AI-generated output coupled with professional judgment, care, and compassion will be essential.[9] In a world where information is abundant and readily available, pharmacists will no longer be required to be fountains of knowledge. The hallmark of expertise will be the ability to synthesize information and make new connections. The challenge for faculty will be helping learners develop adaptive expertise and the interpersonal skills needed to address the problems of an unknowable future.[10]

Conclusion

The use of AI as an integral partner in pharmacy is not a distant possibility but a near-term reality. Over the next 5 years, AI will reshape how pharmacists practice, conduct research, and educate future professionals. Preparing for this partnership is crucial for the profession's evolution.

Recommendations

1. AACP should engage an expert panel to develop instructional materials to be made available to member institutions that teach student pharmacists about the use of AI technologies that can assist pharmacists in performing their clinical work.
2. AACP member institutions should identify (or hire) a faculty champion who has expertise in AI technologies and engages with interprofessional partners (across the campus and at professional conferences) and external stakeholders (eg, industry and health care institutions).
3. All faculty at colleges and schools of pharmacy should participate in training (at regular intervals) regarding the effective use of AI technologies to enhance their instruction and student learning.
4. AACP should partner with other professional organizations to develop certificate programs to upskill the existing workforce about the use of AI technologies in practice, research, and education.

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