

AACP REPORTS

Report of the 2013-2014 Academic Affairs Committee

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BACKGROUND AND CHARGES

According to the Bylaws of the American Association of Colleges of Pharmacy (AACP), the Academic Affairs Committee shall consider: *the intellectual, social, and personal aspects of pharmaceutical education. It is expected to identify practices, procedures, and guidelines that will aid faculties in developing students to their maximum potential. It will also be concerned with curriculum analysis, development, and evaluation beginning with the pre-professional level and extending through professional and graduate education. The Committee shall seek to identify issues and problems affecting the administrative and financial aspects of member institutions. The Academic Affairs Committee shall extend its attention beyond intra-institutional matters of colleges of pharmacy to include interdisciplinary concerns with the communities of higher education and especially with those elements concerned with health education.*

To provide direction on how academic pharmacy should engage in technology-enabled education and to elaborate on AACP's role in the development of new educational resources, technologies and learning models, President Peggy Piascik charged the Committee to consider the following questions:

1. Is there a place for Massive Online Open Courses (MOOCs) in pharmacy education? If so, what are the opportunities and barriers for developing and implementing a platform for online courses across the academy?
2. What is the potential role of games in pharmacy education? How can AACP assist colleges and schools in developing and implementing this technology? In which areas of the curriculum, do games have the most potential for impact?

3. How can AACP educate and assist schools and colleges in adopting learning analytics to maximize the use of big data for programmatic and curricular priorities?
4. How can the *Academy* assist faculty in scholarship endeavors with regard to the following emerging technology issues? Potential areas may include:
 - Quality assurance methods in technology-enabled teaching and learning
 - Accreditation standards revision that supports innovation in educational technology learning and assessment models
 - Recognition within the promotion and tenure process to faculty who are innovators in advancing technology-enabled education

In August 2013, Committee members were provided with resources and background literature to read prior to the standing Committee meeting. Members were also assigned to sub-groups to delve deeper into the literature pertaining to topics of the charge. Group one considered the topics of MOOCs and gamification of learning, while group two examined learning analytics and faculty scholarship regarding emerging technology issues. At the standing meeting on October 28-29, 2013 in Washington, D.C., the Committee as a whole engaged in critical dialog while considering each of the charge questions and developed recommendations, policy statements, and suggestions as appropriate. At the conclusion of the meeting, Committee members were divided into four sub-groups of two members each to write and elaborate on specific sections of the committee's work.

The purpose of this report is 1) to provide requisite background literature and information regarding the charges, and 2) to provide recommendations to AACP and the *Academy* pertaining to these emerging issues.

INTRODUCTION

Higher education is facing a myriad of challenges due to a rapidly-changing technological environment. The 2012-2013 Argus Commission studied “game changers” likely to influence pharmacy education.¹ A major theme of their report was using instructional (information) technology to its fullest capability to create better instruction and to develop and use analytics for guiding and directing faculty and students.

The New Media Consortium’s (NMC) 2013 Higher Education Report² frames new and emerging technologies in a manner that allows education leaders, policy makers, and faculty to understand the potential impact on teaching, learning, and research. Of the six technologies to watch in the next five years, three have garnered significant interest within the *Academy* as areas warranting further study. Massive open online courses (MOOCs) offer the potential to provide educational resources to a broad audience at high efficiency. The need for fewer resources makes MOOCs extremely appealing to academic institutions during times of economic downturn and reduced federal/state support for higher education. Gamification of learning incorporates elements of games (such as levels and badges) into academic activities with the goal of increasing student interest, motivation, and engagement with the content. In gamified curricula, students accept challenges for points or other rewards and often have significant freedom in choosing what kind of assignments they undertake to achieve them. Finally, learning analytics is a new field to education that aids faculty in deciphering trends and patterns of data to advance personalized learning. Student-specific data can be used to customize tailored learning platforms and guide students to additional resources.

MOOCs IN PHARMACY EDUCATION

There is no commonly accepted definition for massive open online courses (MOOCs), but they have been aptly described as a model for delivering learning content online to any person who wants to take the course, with no limit on attendance.³ MOOCs have been touted as both the next great technological disruption in higher education⁴ and as nothing more than an overhyped threat that will unbundle the provision of teaching services from faculty⁵ and devalue education.⁶ In 2012, and to a lesser extent in 2013, the presence and use of MOOCs expanded rapidly with numerous high profile universities including

Stanford, MIT, and Harvard investing significant financial resources into developing courses with free and open access.⁷ The underlying premise that MOOCs can provide access to world-renowned experts and classes at little to no cost to users is laudable. The promise of reduced barriers of entry to a low cost education is also something that most educators agree is needed.⁸ A business model for long-term sustainability of MOOCs has yet to be identified. There is significant angst regarding the low completion rates of MOOCs compared to traditional education (regardless of the reasons why people choose to participate) and academic credit is an issue because many institutions (including the providers) often refuse to recognize MOOCs as legitimate courses.⁹ Many educators question the rigor and value of a MOOC education.⁸ Although it may take a several years for the MOOC environment to mature and stabilize, the *Academy* must begin to consider the role that MOOCs will play in the future of pharmacy education.

Is there a place for MOOCs in pharmacy education?

The pharmacy *Academy*, like so many educational organizations across the country, must ponder the question of whether it needs to develop its own MOOCs. At the heart of that question is how will MOOC technologies help further the visions of the *Academy* and what exactly would we be trying to achieve. Is the MOOC model an adequate fit for pharmacy education?¹⁰ Lucas Jr.¹¹ describes MOOCs as free and open online courses originally designed to extend the reach of institutions that are evolving into a new way of teaching for-credit courses and programs. As the name implies, some MOOCs have tens of thousands of students participating¹. Three important considerations regarding the MOOC model arise from this description. Does the *Academy* teach any topics that would generate interest from masses of people? Are we willing to provide free, open enrollment courses for which MOOCs are deemed appropriate? Are faculty willing to create and offer content that is open to the public? Given these considerations, the role of online courses that meet the true definition of MOOCs may be somewhat limited within academic pharmacy. However, there may be other online education opportunities outside the traditional MOOC concept that could be of value to the *Academy*. For example, a series of MOOC-like courses regarding career pathways available to pharmacy graduates may be something that AACP and *Academy* faculty would support. Possible implications of the Affordable Care Act¹² on medical and pharmacy services is another subject that potentially lends itself to broad appeal. MOOCs also have the potential to serve as an appropriate delivery mechanism for general faculty, preceptor, and/or student development.

Other types of online courses with restricted access may have greater potential within pharmacy education than true MOOCs. Although these courses may have limited enrollments of tens or hundreds of students, rather than thousands, that does not make them any less important or useful. One practical example of this is the topic of federal pharmacy law. Why should every US College/School of Pharmacy develop their own specific course for federal pharmacy law when the laws are the same for everyone? While some schools benefit from a local faculty member recognized as an expert in the field, others may struggle year to year to identify individuals with the requisite expertise to teach the course. An opportunity exists for the pharmacy academy to create courses or educational content locally and make it available to all members of the *Academy*. Advantages of this approach include the ability of faculty and students at all colleges/schools to benefit from expertise that may not be present locally, the ability to provide educational offerings to students they would not otherwise have, the ability for faculty members who provide these courses to gain increased recognition, the ability to stimulate international development of pharmacists, and the ability of colleges/schools to focus financial and human resources on areas of expertise and strength.

Although great potential exists for the use of common/shared online courses and modules across the *Academy*, there are also some issues that would need to be addressed. One common fear among faculty is that the workforce could be reduced as fewer faculty members would be needed due to the commoditized content. At the *Academy* level, a peer review process for online courses and content might also be necessary to ensure high quality. Another question to consider is whether faculty at colleges/schools with existing online courses would support online education at the *Academy* level. The business model for these ventures will be important and must address how colleges/schools and contributing faculty members would receive recognition and share of revenue. Finally, the technical logistics for developing, delivering, and managing these courses would need to be determined and any accreditation issues would need to be addressed.

Analyzing the opportunities for MOOCs in pharmacy education according to the contemporary understanding of what MOOCs are may undersell the potential. The role of online education in other forms that embraces many of the MOOC philosophies is expected to grow. The *Academy* should look for ways to intelligently lead this growth and identify and develop new opportunities that provide an improved educational experience for all applicable stakeholders.

Recommendations:

1. AACP should develop or form a partnership in order to support an academy-wide online platform for the delivery of educational content which will be advertised to institutional members. The platform will enable members of the academy to publish peer reviewed modules or niche courses that are student ready.
2. AACP should partner with experts in the *Academy* to create open source educational modules to address faculty, preceptor, and student development.
3. AACP should continue to monitor higher education trends related to open source content and MOOCs and discuss their roles in health care education with the *Academy*.

GAMIFICATION OF LEARNING IN PHARMACY EDUCATION

In the book “*Don’t bother me mom – I’m learning!*” Prensky states that students in our colleges today are considered digital natives, having grown up using games and simulations.¹³ The average age of game players in the United States is 30; with 68% of gamers at or above the typical college starting age of age 18.¹⁴ The Net Generation (also known as Millennial Generation) consists of individuals born after 1980 who are currently thirty-four years of age and younger.¹⁵ As students, the characteristics shared by the Millennials include impatience, the ability to multitask, desire for multifaceted classroom experiences, and learning through course content that is animated and interactive.¹⁶ Prensky characterizes these students as being in constant communication with each other, thriving on instant gratification and frequent rewards, and preferring fun game style to more serious environments. He also claims that evidence exists that indicates these persons brains have physically changed as a result of their use of digital environments and experiences.¹³

While the terms “games” and “gaming” may have a negative connotation among many educators, the use of games for educational purposes has merit. Serious educational game play supports a variety of pedagogical approaches through the use of student-centered constructivist learning environments. These environments allow students to develop strengths in critical thinking and creativity, validate their ideas, and collaborate with others; all skills that are transferrable to real world contexts.¹⁷ Games used to support learning environments have been referred to as “serious games”¹⁸ meaning that these types of games are driven by educational goals, not merely for entertainment purposes. Contrary to some traditional

lecture environments that have been criticized for inefficiencies in teaching higher-order thinking and problem-solving skills, educational games require students to actively learn by forcing them to make decisions for determining game strategies and solutions. The playing of games is known to stimulate curiosity and interest and have the potential to generate enthusiasm, encourage competition, and increase student engagement.¹⁶ Student engagement with the learning process is one of most oft-cited benefits of gamification.¹⁹ According to Prensky¹³, the reason children spend so much time on computer and video games is because they are having fun within the “unforced learning” opportunities. These types of games that digital natives are now playing are much more complex than previous ones and require players to learn new skills and strategize to advance to more difficult levels. Complex games feature compelling goals, are designed to adapt to a player's skill level, and increase in difficulty to maintain the player's attention and engagement. Complex games require the player to make decisions regarding what to do, when to do it, how to plan and prepare, and determine the strategy to achieve the goal.

An important characteristic of games is they offer challenges for students regardless of ability or level of play, and help educators engage students who need to refocus their attention on the curriculum.²⁰ Serious educational games provide the opportunity for students to learn at their own pace by creating an environment that actively encourages peers to teach and learn from each other. In addition, the use of games improves traditional educational methods by encouraging students to keep trying even when they lose, and to continue practice until they have mastered the content.²⁰ Games can be designed to utilize characteristics of cognitive stimulation, motivation, constant assessment, and the encouragement of a system style of thinking. A well-designed game motivates the player in a goal-oriented method using a carefully calibrated balance of rewards, challenges, and chance.²¹ The use of games in higher education is suitable when students are expected to think critically and solve problems while reinforcing concepts anticipated in real world applications. Educational games allow for the provision of real-time, dynamic student feedback. The process of continuous feedback is beneficial as games can constantly and automatically assess a learner's ability from start to finish; a tool not common to other forms of content delivery.²¹ With future advances of technology, new research, and enhanced systems development, motivational techniques of games may continue to be improved and provide students with the tools for becoming higher achievers in real life.²² The use of games in the classroom is not meant to replace all methods of instructional strategy. However,

games are effective as a supplement, providing background and content in an engaging, motivating, and enjoyable environment that is familiar and comfortable to students.¹⁶

Implications of Games in Pharmacy and Health Care Education

While the use of serious games has not been widely adopted in health care education, a number of educators in various disciplines have reported the results of innovative application of games for teaching and learning. Although these examples may not exhibit the characteristics of serious, complex game design touted by gamification experts, they offer some insight into the potential advantages of gaming.

Numerous board-type games covering topics such as neonatology,²³ anatomy,²⁴ and metabolic pathways²⁵ have been developed and used successfully in health care education. Students participating in those games reported high learner satisfaction and scored higher on examinations than control groups. Developers of a web-based collaborative game aimed at teaching medical students the organizational and conceptual basics of medical practice observed strong collaboration among student participants and increased motivation to learn.²⁶ Perceptions of medical students participating in a serious game on pediatrics included improved comprehension and enjoyment of learning, as well as a willingness to continue participation in the intervention.²⁷ InsuOnline[®], another game undergoing study was developed by a multi-disciplinary team to improve appropriate initiation and adjustment of insulin for the treatment of diabetes mellitus by primary care physicians. In another study, researchers reported highly favorable views by medical students about the use of video games and related new media technology.²⁸ Similarly, Millennial nursing students also support the use of gaming and new media technologies in nursing education.²⁹

Specific to pharmacy education, Persky and colleagues³⁰ developed and evaluated three interactive games designed to review material and promote critical thinking skills in a basic and clinical pharmacokinetics course. Overall, games appeared to have a positive impact on grades and students found the games enjoyable. A study of a game format approach to learning pharmacotherapy revealed increased student interest and participation.³¹ Another group of educators developed and evaluated a “Geriatric Medication Game”, reporting a positive effect on pharmacy students' awareness of the perceptions and experiences of geriatric patients.³² Barclay and colleagues²² developed and evaluated two card games, “Cardiology Go Fish” and “Infectious Diseases Gin Rummy”, for pharmacy students enrolled in an advanced pharmacy practice experience. At the end of the six-week experience, students' cardiology and infectious

diseases assessment scores improved significantly as compared with scores on pharmacy practice questions.

Developing Serious Games for Pharmacy Education

The development of higher order thinking games based on principles and designs of today's popular entertainment games is expensive and requires significant expertise in both education and game design. Effective serious games can be deceptively difficult to develop and deploy.¹⁹ Most schools and colleges of pharmacy lack sufficient finances, technologies, and personnel with the specific knowledge and skills necessary to create educationally sound, complex games like the ones touted by game experts.

AACP, however, is better positioned to promote serious games in pharmacy education, to identify resources, and to facilitate collaboration to develop higher order games. According to the Horizon Report (2013), universities are beginning to partner with organizations and game design companies for the development and integration of games relevant to their curriculum and student's lives. There are numerous opportunities for serious educational games targeted at outcomes such as interprofessional practice competencies, increased critical thinking skills, and enhanced knowledge and strategic thinking. Utilization of serious games in pharmacy across institutions may facilitate benchmarking and analytics across institutions and provide another alternative to document achievement of learning outcomes. Furthermore, AACP could incentivize quality and promote innovation among students and faculty by offering grants to develop games and opportunities to share experience during the Annual Meeting. Poster sessions at meetings could be enhanced by allowing for interactive technology demonstrations. Finally, AACP could serve as a clearinghouse by identifying and maintaining a database of available serious games that can be adopted or purchased by members of the *Academy*.

Recommendations

1. AACP should develop serious games that can be used in pharmacy education.
2. AACP should promote faculty and student innovation in designing and or implementing serious games to prepare future health care leaders.
3. AACP should compile and make available a list of existing serious games that may be of potential use in pharmacy and patient education.

Policy

1. AACP supports the use and development of serious games to enhance pharmacy and interprofessional education.

Suggestions

1. Colleges and schools of pharmacy should encourage faculty and students to use serious games for learning and professional development when appropriate.

LEARNING ANALYTICS IN PHARMACY EDUCATION

The term analytics is often used alongside the term "big data" and originated in the business sector as a means of tracking consumer behaviors. Analytics involves the statistical evaluation of data sources for the purpose of discerning patterns and making more informed decisions.³³ Analytics is described as the practice of mining and analyzing institutional data to produce actionable intelligence.³⁴ An example of analytics in the business sector is Netflix's analysis of profile information and user activity to make movie suggestions to users.

When analytics is discussed within an academic setting, the term "learning analytics" is sometimes incorrectly used interchangeably with the term "academic analytics".³³ Academic analytics provide data to administration to assess the effectiveness of academic units and to make informed decisions regarding resource allocation, infrastructure enhancements, and other support processes.² Academic analytics is more closely aligned with the term business intelligence. Learning analytics, however, leverages student-specific data to "deliver personalized learning, enable adaptive pedagogies and practices, and identify learning issues in time for them to be solved".¹⁴ Learning analytics focuses specifically on the learner. When implemented correctly learning analytics provides continuous information regarding student performance by utilizing data gathered from technology systems such as learning management systems (LMS), student response systems, computerized exams, library systems, admission systems, and any other system that provides for input of student-specific data. Aggregation and analysis of this data can help predict and track student success, identify students encountering difficulty, and even help students enhance their own learning through personalized education. Researchers and statisticians are working to develop analytical tools to manage the complexity associated with large sets of behavior-specific data.¹⁴

Learning analytics data can be a very valuable tool for instructors. During traditional live face-to-face lectures, it is often difficult for faculty to quantify student engagement beyond attendance. Data mined through learning analytics provides instructors with more accurate information regarding student comprehension (or lack thereof) of instructional content. Equipped with this type of robust information, faculty members can use their

expertise to refine teaching practices, assist students in correcting deficiencies, and/or provide supplemental/enhanced learning opportunities to those already achieving competency.² Insight gained from learning analytics can also be used to guide faculty development programming, foster student support measures (e.g. early alert monitoring), and to enhance overall curricular efficiency. Finally, another advantage of learning analytics is that real time or nearly real time information regarding students' academic performance and likelihood of success enables them to take informed responsibility for their learning.

Implications of Learning Analytics for Pharmacy Education

The push to incorporate "big data" has tremendous implications for pharmacy education. With the ever-increasing accountability for educators to prove student learning and the availability of technology tools to assist with that, now is an opportune time for pharmacy education to become more flexible and personalized. The incorporation of learning and analytics technologies will allow education to progress from an instructor- to a student-driven model. While we are not there yet, the potential exists for students to move through the curriculum autonomously, self-paced, with the goal of mastery, and with faculty roles revolving more into learning facilitator rather than content provider. If we want our students to become life-long learners we must culture that within them. Their self-awareness of growth and natural inquisition enabled by learning analytics may assist students as they evolve into life-long learners.¹

Many academic institutions have already incorporated technology that is capturing analytics data, but they must continue to ensure that sufficient resources are available to capture and analyze the appropriate data in an efficient manner. They must also allocate sufficient resources to provide training and guidance to faculty, so that data can be interpreted correctly and used effectively. For learning analytics to be successful at a curricular level, there are numerous other issues to consider. Transitioning traditional lecture content to various types of digital formats is necessary to capture student learning data. Online learning modules, simulations, and student response systems are options to consider, with the key point being that student engagement with the learning materials is required. Perhaps an even more monumental task is the development/re-development of assessment methods that are detailed and comprehensive enough to identify learner strengths and weaknesses. This would involve mapping each and every assessment item to outcomes, concepts, and/or difficulty levels. All faculty members will need to be informed of and engaged in the process to make this viable. Furthermore,

technical systems such as "data dashboards" and other reporting tools will need to be in place, as will personnel who are skilled at interpreting the data. From a process standpoint, the methods of data collection and analysis must be transparent and all legal, ethical, and privacy concerns addressed.^{33,35} Finally, plans must be in place regarding how to react to these new types of learning data and what action steps to take when results are disturbing or exceptional at either an individual or school level.

The pharmacy *Academy* has embraced assessment as an important principle and AACP has long been collecting programmatic data that forms a basis for academic analytics. Continued and coordinated collation, interpretation, utilization, and distribution of this data are necessary to support individual program advancement. However, learning analytics operates at the level of individual learners and many schools/programs may not have the fiscal and human resources to devote for that purpose. AACP, the Assessment SIG, and the Institutional Research and Assessment Committee (IRAC) should work in concert to develop educational opportunities for the *Academy* regarding learning analytics. These learning opportunities might include guidance on initial implementation of learning analytics, developing appropriate assessment techniques, information regarding learning analytics best practices, and the identification of companies/vendors that offer learning analytic software and/or other supportive systems. Finally, strong consideration should be given to the development of a white paper and incorporation of analytics as a topic within an upcoming AACP Assessment Institute.

Recommendations

1. AACP should inform the academy on the topic of learning analytics and how the use of data can improve student outcomes and educational programming.
2. AACP should investigate vendors associated with learning analytics and invite them to the annual meeting.
3. AACP should consider the inclusion of learning analytics as a topic in future AACP Institutes.
4. AACP should consider charging an appropriate committee and/or SIG to develop an in-depth learning analytics white paper.

FACULTY SCHOLARSHIP ISSUES PERTAINING TO EMERGING TECHNOLOGIES

There has been an increasing recognition within academia that what comprises *research* from a promotion and tenure standpoint needs to be broadened.

Indeed, the more inclusive term *scholarship* has supplanted the word *research* in many academic settings. This broadened definition and consideration of scholarship has been reflected in newer bylaws and policy statements by AACP, and has been recommended for incorporation in promotion and tenure documents in colleges and schools of pharmacy by educators in *AJPE*.³⁶⁻³⁷ The recent proliferation of emerging and innovative educational technologies necessitates further consideration of scholarship opportunities by AACP and the Academy. Examples of such technologies, some of which have been discussed in this report, include MOOCs and tablet computing that are already being implemented by many institutions of higher learning; educational games and learning analytics that are likely to accelerate within the next 3 years; and 3-Dimensional printing and wearable technology (i.e. integration of digital information and electronics into wearable accessories) that are likely to be adopted within the next 5 years.³⁶ These emerging and innovative educational technologies have led to active discussions and exchanges of information on the internet and the development of portals dedicated to fostering and distributing this information. The American Association of Medical Colleges (AAMC) and American Dental Education Association (ADEA) have developed an online tool, MedEdPORTAL^{®38}, which may serve as an example. The mission of MedEdPORTAL[®] is to “promote educational scholarship and collaboration by facilitating the open exchange of peer-reviewed health education teaching and assessment resources.” It is possible that the pharmacy academy could form a partnership with these organizations to add content to MedEdPORTAL[®] or identify or develop another tool to accomplish this purpose.

AACP should facilitate these information exchanges and provide and promote opportunities for *Academy* members to disseminate novel forms of educational materials and instruction related to newer technologies. For example, AACP could provide opportunities for members to present and demonstrate their findings in special sessions at its annual meeting and encourage *AJPE* to consider publication of more novel educational designs and techniques. Further, AACP could distribute information to its members on external groups that provide for similar opportunities. Finally, AACP should encourage the incorporation of these innovative forms of scholarship in promotion and tenure guidelines by colleges and schools of pharmacy. One example of this is provided by the Modern Language Association (MLA)³⁹, which offers a guide for evaluating digital works for promotion and tenure

decisions. Among other things, the guide recommends explicit reference to digital work in job descriptions and that digital works be judged based on media-specific criteria by faculty knowledgeable of the medium.

The following proposed policy statement, recommendations, and suggestion have been drafted to help guide AACP and the *Academy* on faculty scholarship issues pertaining to emerging and innovative technologies.

Policy

1. **Policy Statement 1:** AACP supports the use and development of emerging and innovative technologies, including but not limited to serious games and simulation, to enhance pharmacy and interprofessional education. (Source: 2013-14 Academic Affairs Committee)
2. **Policy Statement 2:** AACP supports the inclusion of scholarship devoted to emerging and innovative technologies in promotion and tenure policies. (Source: 2013-14 Academic Affairs Committee)

Recommendations

1. AACP should promote technology-related educational scholarship and collaboration by facilitating the open exchange of resources via a knowledge portal.
2. AACP should provide opportunities at meetings and in digital or social media for members of the academy to present and demonstrate emerging and innovative technologies.
3. AACP should promote opportunities to disseminate technology related educational scholarship outside of the academy.

Suggestion

1. Schools and colleges of pharmacy should recognize scholarship related to emerging and innovative technologies in promotion and tenure policies.

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