RESEARCH BRIEF

Providing an Academic APPE Elective via Videoconference Between Off-campus Faculty and Students

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Objective. To describe students' experiences and learning outcomes of an academic advanced pharmacy practice experience (APPE) elective provided via videoconference. Faculty preceptor and experiential administration's perspectives also are described.

Methods. This 5-week APPE was developed using backward design and delivered starting in 2015 via videoconferencing, with the faculty preceptor and students physically located in different locations throughout the state. After the APPE, students completed a retrospective survey comparing their perspectives and learning outcomes before and after the rotation. They also provided feedback on the experience. Students completed the standard APPE evaluation. Faculty preceptor's self-reflections and experiential administration's perspectives were documented.

Results. Six students completed this unique APPE over three academic years. After the rotation, five students (83%) stated that their interest in a full-time academic career increased, while one student's (17%) interest stayed the same. All students stated there was "no hindrance" with this rotation being conducted via videoconference or with the geographical distance between the faculty preceptor and them. Student ratings of nine learning outcomes increased after completing the APPE, demonstrating their perception of their knowledge improved in all topic areas.

Conclusion. Students, the faculty preceptor, and experiential administration deemed this videoconference academic APPE effective and successful. This experience affords students, without regard for physical location, the opportunity to pursue interests in academia, adds to the variety of APPEs offered by the school, and allows students to learn about careers in academic pharmacy, an area of growing need in the pharmacy profession.

Keywords: academia, advanced pharmacy practice experience, distance teaching, faculty, videoconference

INTRODUCTION

Pharmacy schools continue to face the strain of vacant faculty positions. In the 2015-2016 American Association of Colleges of Pharmacy (AACP) survey of vacant budgeted and lost faculty positions, 129 of 139 schools reported 454 vacant and/or lost positions, with 46.3% of those being in pharmacy practice (PP).¹ Although this represents a decrease (32.6%) in vacant positions from the previous year, schools have continued to struggle with faculty recruitment and retention. The same survey results from 2014-2015 saw a 9.1% increase in vacant positions as compared to the 2013-2014 year.²

To alleviate some of the strain of open positions, schools have an opportunity to encourage students to pursue careers in academia. With encouragement comes the

need for educating students about faculty roles and responsibilities. Sheaffer and colleagues concluded the same when they identified deterrents and motivators in four groups of students (final year of education) and practitioners (residents, faculty members within five years, clinical pharmacy practitioners).³ They identified several variables for final year students that influence their consideration of a career in academia: participation in classroom teaching, course design and assessment, and participation in research and professional writing activities. Based on their findings, the authors suggested that offering students opportunities to participate in well-designed teaching and research experiences might stimulate their interest in academic careers in the future.³ In 2010, Eiland and colleagues noted that efforts to expose students to academic careers should include identifying student interests and educating students regarding potential misconceptions about academic careers.⁴ The 2016 AACP graduating student survey found that 559 (5%) of

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the 11,093 students who completed the survey indicated primary plans to enter a career in academia after graduation.⁵

In 2015, Haines and colleagues found 96% of 96 responding US pharmacy schools offered an academic APPE as a method of exposing student pharmacists to academic careers, with the APPE being either a four- to six-week block or a longitudinal experience throughout one to two academic terms.⁶ They also identified several perceived challenges to offering academic educational experiences to student pharmacists. The most commonly cited challenge was a lack of faculty time to provide an academic experience because of other workload demands.⁶ The second most common perceived challenge was a lack of student interest.⁶

Few published manuscripts describe design and outcomes of academic APPE electives. A review of the literature identified studies of academic APPE electives that were taught by a single faculty member or a team and on one or two campuses.⁷⁻¹⁰ One APPE used videoconferencing technology between two campuses, with students and faculty on both campuses.⁸ All APPE electives lasted from five to six weeks and focused on concepts of teaching and service.⁷⁻¹⁰ Three APPEs also focused on scholarship, and one discussed academic pharmacy administration.^{7,8,10} All studies reported positive student and faculty feedback of the APPEs.⁷⁻¹⁰ Sylvia surveyed graduates (N=27) who had completed her academic APPE elective between 2000-2004.⁷ Sixteen graduates responded, of which 10 reported that they held either a full-time (N=3) or adjunct faculty (N=7) appointment. Fifteen graduates indicated using the skills learned in this APPE on a daily (N=12) or weekly (N=3) basis in their current practice.

The PP department at Auburn University Harrison School of Pharmacy includes 38 full-time faculty located throughout the state and in two locations in surrounding states. These faculty members have practice sites and precept students on APPEs in one of four designated clinical education regions. There are between four and 16 PP faculty per region. One PP faculty member is located outside of the four established regions. Each clinical education region has a conference room and classroom with equipment for videoconferencing technology. Each faculty member has software on their laptop or desktop that allows them to connect via videoconference with the campus and with faculty located in any region. This technology is not only used for teaching by offsite faculty but also for service responsibilities and collaboration with faculty who are in other regions. Students also are able to download the videoconferencing software to their laptops.

Student pharmacists are assigned to one of the four clinical education regions for their fourth professional year of APPEs. Students will complete most, if not all, of their APPEs in that assigned region with full-time PP faculty and volunteer affiliate preceptors. In addition to the required rotations that the PP faculty members teach, they also may offer APPE electives in academia. In these academic APPEs, student activities are focused primarily on teaching in a single course. Until now, academic APPE electives have only been taught by faculty preceptors within a specific region to students who are assigned to that same region.

APPE electives, such as an academic elective, offer experiences that “permit exploration of and/or advanced study in areas of professional interest” and give student opportunities to “(1) mature professionally, (2) secure the breadth and depth of experiences needed to achieve the Educational Outcomes articulated in Standards 1-4, and (3) explore various sectors of practice” per the Accreditation Council of Pharmacy Education (ACPE) Curriculum Standards for the Doctor of Pharmacy Degree.¹¹ Academic APPE electives also provide opportunities to meet the Center for Advancement of Pharmacy Education (CAPE) outcomes in problem solving, educating and communicating, as well as, personal and professional development.¹²

The primary objective of this study was to describe students’ experiences and learning outcomes of an academic APPE elective that was delivered entirely via videoconference. Secondary outcomes were to describe the faculty preceptor’s and experiential administration’s perspectives of a distance-based APPE.

METHODS

An academic APPE elective was designed in 2015 when a full-time faculty preceptor relocated to an area outside of the school’s established clinical education regions. This 5-week APPE was developed using the backward design method. The foundation of the backward design process is to first, determine the desired results (learning outcomes of the APPE).¹³ Second, decide on the acceptable evidence of learning outcomes and third, develop the learning experiences, which in this APPE needed to be conducted using videoconference.¹³ All 150 third-year students were offered the opportunity to select this APPE elective for the 2015 and 2016 academic P4 year. For the 2017 academic year, students had to request this APPE. Once assigned to this APPE, students met individually via videoconference with the faculty preceptor to review the purpose and general activities of the rotation and ensure the student fully understood the

rotation requirements of this elective. When possible, students were assigned to the elective when the faculty preceptor was teaching in several didactic classes to best expose the students to academic activities. If this was not possible, the faculty preceptor asked other course coordinators to allow the APPE students to participate in their course. The rotation was divided into six main topics: introduction to academia, learning styles, course development (educational theories, teaching methods, developing a syllabus and learning objectives), test questions and analysis, educational research/scholarship of teaching and learning, and service. Each topic was associated with assigned readings, active-learning activities, discussions and a self-reflection. Active-learning activities varied per topic. For example, when learning about the roles of a faculty member, students interviewed three faculty members from other departments, including an administrator. When discussing learning styles, students completed three learning style inventories to prepare for discussion. Students peer-reviewed a course syllabus and two sets of course and class objectives. Students wrote and peer-reviewed approximately five test questions and completed a journal club presentation on a self-selected academic paper.

APPE students participated in several didactic classes and planning sessions (P3 therapeutics course, P1-P3 skills laboratory, P3 electives, P1-P3 introductory pharmacy practice experience (IPPE), and P4 professional seminar) via videoconference or in-person if they were on campus. Students attended approximately three class sessions (1-3 hours per class) each week and one or two skills laboratories (8-16 hours) in each APPE. Planning sessions were 1-2 hours each week. Students were in class for an average of 14 hours per week and supervised for all activities. The faculty preceptor was on videoconference for class sessions. APPE students could attend a class in person, if they were located on the same campus as the coursework, but videoconferencing was primarily used. The level of student participation in class depended on the class. For example, APPE students posed questions to students within the therapeutics course, IPPE, and professional seminar. However, involvement with active-learning activities varied for each elective. For skills laboratory, all students were physically on campus and served as facilitators of group activities. The faculty preceptor was on campus with the students for some skills laboratories; otherwise, another faculty member supervised and provided feedback to the faculty preceptor.

Each week, students had approximately five hours of assigned pre-readings and activities to complete before topic discussions. The students and faculty preceptor met

for approximately 1.5 hours on average – twice weekly via videoconference to discuss the weekly topic. The journal club presentation, all topic discussions, and the midpoint and final student evaluations were held via videoconference with the faculty preceptor. In addition, APPE students attended faculty member interviews, department meetings or admissions interviews on videoconference or in person, if on campus. The faculty preceptor attended the same sessions via videoconference. Time spent in direct contact with the faculty preceptor varied per week. On average, students spent five hours a day on videoconference with the faculty preceptor in the various APPE activities. Student reflections were emailed weekly to the faculty preceptor.

At the end of the rotation, students were asked to complete an electronic survey in Qualtrics (Provo, UT) comparing their perspectives of the academic rotation design, activities and learning outcomes before and after the rotation and provided feedback on the experience. Each student was required to complete the school's standard preceptor/APPE evaluation administered electronically through PharmAcademic (McCreadie Group, Ann Arbor, MI). This de-identified data was collated and provided to the faculty preceptor at the end of the academic years. Data from both surveys were analyzed using descriptive statistics. The faculty preceptor completed teaching reflections after each APPE elective offering. After the first academic year, feedback was requested from the experiential administration on this unique APPE experience. Summaries of the faculty preceptor's reflections and experiential administration's feedback were collated. The university institutional review board approved this project.

RESULTS

Six students completed this APPE over three academic years. The faculty preceptor was located at a site four hours from campus. Four students were located on campus, and two students were located in a clinical education region approximately two hours from the faculty preceptor. All six students completed the survey at the end of the APPE and the school's required preceptor/APPE evaluation.

Students reported they selected the APPE because they wanted to learn about academia (100%), considered it an important rotation for a future career as a full-time faculty member (33%) or affiliate faculty member/preceptor (83%), sought teaching opportunities (83%), or because it offered a flexible rotation (33%). No students selected the rotation thinking it would be "an easy APPE." Two students (33%) were interested in learning

about a new career option. One student (17%) specifically wanted to evaluate a full-time career in academia. Two students (33%) reported being unsure, and one student (17%) was not interested in a full-time academic career. But all three students were interested in serving as preceptors in the future. After the APPE, five students (83%) stated that their interest in a full-time academic career increased, while one student's (17%) interest stayed the same. All six students responded that the APPE was thought-provoking and interesting, increased their knowledge regarding a full-time academic career, assisted with their preparation for residency applications and interview process, and perceived that it helped prepare them to work with a pharmacy school in a teaching or a precepting capacity in the future.

The students provided positive feedback on the APPE design and structure. All six students responded with "yes" that they had a clear understanding of the objectives, were provided enough autonomy to achieve the objectives, and the experience met each rotation objective (Table 1). All students agreed with the statement that the organization and structure of the APPE was conducive for learning about academia. Four students (67%) selected that the APPE workload was "just right," and two students (33%) selected "very light." No student selected "too much." All six students selected there was "no hindrance" in the rotation being conducted via videoconference. All students selected there was "no hindrance" with the faculty preceptor not being at the same physical location as the student, and the overall communication with the faculty preceptor was "good" out of options of good, fair, and poor. For the two students not on campus, both chose "no hindrance" of being off campus. All six students selected they would recommend this APPE to other students.

Table 1. Academic APPE Elective Course Objectives

By the end of the APPE course, the student shall be able to:
Describe the role and responsibilities of a faculty member.
Differentiate between pathways of a faculty position and academic career options.
Describe learner styles.
Given course materials, evaluate teaching objectives and analyze a course syllabus.
Compare and contrast a variety of instructional methodologies used by faculty members in current courses.
Analyze a variety of assessments used by faculty members in current courses.
Describe the research process.
Describe service activities of a faculty member's position.

Table 2 details students' perspectives of the APPE activities. Active-learning activities, readings and discussions, and the journal club were primarily rated as "extremely valuable." However, reflections, which were independent written assignments, had the lowest ratings of "valuable." Two students stated the most interesting activity was developing test questions and analyzing students' performance while the other four students had varying answers ("participating in classes," "interviewing/meeting with the different types of faculty members," "building a class day from scratch" or "learning about the behind-the-scenes aspects of the classes"). Three students (50%) stated that reflections were the least interesting activity. Two students (33%) stated some readings were the least interesting.

The assessment of learning outcomes demonstrated the students' perception of their growth in knowledge in all topic areas after completing the APPE (Table 3). The knowledge of the scholarship of teaching and learning had the largest increase in student agreement of the survey questions. The topics of developing test questions and answers and becoming familiar with different teaching methods had the second largest increase in perceived knowledge growth after completing the APPE.

All six students completed the preceptor/APPE evaluation. All students strongly agreed that "the scheduled activities were designed to meet specified course goals and objectives," and the APPE "possessed an adequate level of organization and structure," "provided a sufficient degree of challenge," "stimulated my interest in this area of practice," and "has the potential to provide a positive learning experience for future students." Five students (83%) stated they "strongly agree" and one stated "agree" that the APPE "allowed me to apply what I learned in other pharmacy courses." All three questions relating to the preceptor's communications skills were rated positively as "strongly agree" by the six students. All six students rated the faculty preceptor's overall teaching ability as "exceptional," the highest rating. Students were able to individually state in free-text form strengths and weaknesses of the faculty preceptor and rotation. Students commented positively on a wide variety of experiences, the discussions and design of the rotation. Two students stated they would have liked the opportunity to teach ("present to students or lead a discussion") specifically in an elective or IPPE, while one student stated they liked not being "forced to actually teach on the rotation."

The faculty preceptor's reflections and experiential administration's feedback of the APPE were positive. The development of this flexible APPE offered an additional opportunity for students to develop their personal

Table 2. Students' Perspectives of the Value of the Academic APPE Learning Activities (N=6)

Topic	Activity	Extremely Valuable (%)	Valuable (%)	Neutral (%)	Not Valuable (%)	Extremely Not Valuable (%)	Item M (SD)
Introduction to Academia	Readings and discussions	83	17	0	0	0	4.8 (0.4)
	Faculty position questionnaire	83	17	0	0	0	4.8 (0.4)
	Meetings with faculty members from other areas of the school	100	0	0	0	0	5
	Reflection	17	83	0	0	0	4.2 (0.4)
Learner Styles	Readings and discussions	83	17	0	0	0	4.8 (0.4)
	Learner style quizzes	100	0	0	0	0	5
	Reflection	33	67	0	0	0	4.3 (0.5)
Course Development	Syllabus and objectives readings and discussions	100	0	0	0	0	5
	Peer-review of course syllabus and objectives	100	0	0	0	0	5
	Syllabus & objectives reflection	50	50	0	0	0	4.5 (0.5)
	Course design readings and discussions	100	0	0	0	0	5
	Course design reflection	17	83	0	0	0	4.2 (0.4)
	Participating in therapeutics class, skills labs, electives, and professional seminar	100	0	0	0	0	5
	Participating in IPPE ^a (n=5)	50	17	17	0	0	4.4 (0.8)
Test Questions	Readings and discussion	67	33	0	0	0	4.7 (0.5)
	Writing questions and answers	100	0	0	0	0	5
	Peer-reviewing of questions and answers	83	0	17	0	0	4.6 (0.8)
	Reflection	17	83	0	0	0	4.2 (0.4)
Educational Research	Readings and discussion	67	33	0	0	0	4.7 (0.5)
	Reflection	17	83	0	0	0	4.2 (0.4)
Service	Readings and discussion	67	33	0	0	0	4.7 (0.5)
	Participating in admissions interviews, attending dept./school meetings	83	17	0	0	0	4.8 (0.4)
	Reflection	17	83	0	0	0	4.2 (0.4)
Other Assignment	Journal Club	67	33	0	0	0	4.7 (0.5)

Abbreviations: IPPE = introductory pharmacy practice experience

^a Not all students participated in these activities

5=extremely valuable, 4=valuable, 3=neutral, 2=not valuable, 1=extremely not valuable

interests in academia without restrictions on locations of the students or faculty preceptor.

DISCUSSION

The school's preceptor/APPE evaluation had similar feedback to the student survey; thus, supporting a successful APPE. Students' responses regarding the rotation design, preceptor communication, and student learning matched the responses to the student survey. Individual student written feedback in the preceptor/APPE evaluation matched objective questions in the student survey. However, in the preceptor/APPE evaluation, individual

student responses were conflicting regarding teaching opportunities provided during the APPE, but this was not mentioned in the student survey. All APPE students led facilitated discussions with students in the skills laboratory; however, two students mentioned they would have liked an opportunity to provide didactic teaching. Although the reflections had lower value ratings in the student survey, they were not mentioned as a weakness in the preceptor/APPE evaluation.

Positive students' perspectives and learning outcomes from this APPE were similar to evaluations of academic APPEs by Sylvia, Morin and colleagues and Roche and Limpach.^{7,8,10} Morin and colleagues found 8

Table 3. Students' Perspectives on Learning Outcomes of the Academic APPE (n=6)

Statement	Strongly Agree (%)	Agree (%)	Somewhat Agree (%)	Somewhat Disagree (%)	Disagree (%)	Strongly Disagree (%)	Response Mean (SD)
I was able to describe the roles and responsibilities of a faculty member.							
Before the APPE	0	0	33	50	17	0	2.3 (0.7)
After the APPE	100	0	0	0	0	0	5
I was able to differentiate the pathways of a faculty position (assistant to associate professor, associate to full professor, tenure vs non-tenure tracks).							
Before the APPE	0	0	17	33	33	17	1.5 (1)
After the APPE	83	17	0	0	0	0	4.8 (0.4)
I was able to differentiate the academic career options of a faculty position (clinical practice faculty vs. research faculty vs administrative faculty).							
Before the APPE	17	0	33	17	33	0	2.5 (1.4)
After the APPE	83	17	0	0	0	0	4.8 (0.4)
I was able to identify components and requirements of a syllabus.							
Before the APPE	0	0	50	17	33	0	2.2 (0.9)
After the APPE	100	0	0	0	0	0	5
I was able to develop learning objectives.							
Before the APPE	0	17	17	17	33	17	1.8 (1.3)
After the APPE	100	0	0	0	0	0	5
I was familiar with the different teaching methods (eg, problem- or team-based learning, flipped classroom, etc.).							
Before the APPE	0	0	17	33	17	33	1.3 (1.1)
After the APPE	83	17	0	0	0	0	4.8 (0.4)
I was able to develop test questions and answers.							
Before the APPE	0	0	17	33	17	33	1.3 (1.1)
After the APPE	83	17	0	0	0	0	4.8 (0.4)
I knew the meaning of scholarship of teaching and learning.							
Before the APPE	0	0	0	17	67	17	1 (0.6)
After the APPE	83	17	0	0	0	0	4.8 (0.4)
I was/am likely to pursue a full-time career in academia.							
Before the APPE	0	17	33	33	17	0	2.5 (1)
After the APPE	17	17	67	0	0	0	3.5 (0.8)
I was/am likely to pursue becoming an affiliate preceptor. ^a (n=3)							
Before the APPE	33	33	33	0	0	0	4 (0.8)
After the APPE	100	0	0	0	0	0	5

^a Only students who selected they were not interested in a full-time academic career were asked to answer this question
5=strongly agree, 4=agree, 3=somewhat agree, 2=somewhat disagree, 1=disagree, 0=strongly disagree

of 12 (66.7%) of their students had an increased career interest in pursuing academia, where this study's survey found five (83%) students' interest in academia increased.⁸ Individual written student comments from this survey were comparable to Hammer and Paulsen's descriptive student feedback from the five students who participated in their academic APPE.⁹ Students enjoyed analyzing data from student assessments and seeing the classroom from a teacher's viewpoint. Students' perspectives of workload were similar to those found by Morin and colleagues, with 10 of 13 (77%) of their students stating the workload was "just right" while four (67%) of this study's students stated the same.⁸ The three other students in Morin and colleagues' study, and two other

students in this study, stated the workload was "too little" or "very light," respectively.⁸ Roche and Limpach noted reflections as a strength of their APPE, whereas the students in this study did not value this activity as much.¹⁰ Morin and colleagues described an APPE elective that was simultaneously taught via videoconference between two campuses; however, unlike this APPE, their faculty were in the same physical location as the students.⁸ The videoconferencing technology used by Roche and Limpach was not for conducting an academic APPE but for APPE students to assist with the teaching of distance students in a basic sciences course.¹⁰ All six students in this survey, all 18 students in Sylvia's survey, and 11 of 12 students (96.1%) in Morin and colleagues' study stated

they would recommend the academic APPE to other students.^{7,8} The most recent student to complete this academic APPE inquired as a P3 when he witnessed the preceptor's prior APPE students involved in a didactic elective. Sylvia also found students selecting the APPE based on their interactions with previous academic APPE students.⁷ While the majority of topics, content, and activities of this APPE parallel those inquired about by Haines and colleagues, this APPE provided students a unique experience to peer-evaluate a course syllabus and their peer-written test questions.⁶

The faculty preceptor completed teaching reflections throughout the APPE experiences and was pleased with the design and outcomes of the rotation. Students were engaged throughout the APPE and seemed to enjoy the activities. Distance teaching worked well, and there were minimal technological issues that occurred. Potential changes to the structure for future offerings based on the faculty's observations and the student survey responses were documented in the teaching reflections. For example, ideas included reducing the number of student reflections, the addition of readings on metacognition in the course design section, and revision of the reflection assessment rubric.

This APPE exposed students to new career opportunities and helped the school meet certain ACPE standards and CAPE outcomes. From 2015 to 2018, seven PP faculty members provided academic APPE electives in addition to the academic APPE discussed in this brief. These seven faculty members would only precept students if they were in the same physical region as the faculty preceptor, and not all regions had faculty who provided academic APPEs. Thus, students assigned to a region without an academic APPE would have been required to relocate to another region offering the experience or select a different elective. Offering this academic APPE elective via videoconferencing technology allowed students in any region to participate without having to relocate for the 5-week experience. In addition, this academic APPE provides student exposure to the teaching, research/scholarship, service, and administration aspects of academia, whereas the academic APPEs offered by the other PP faculty focus primarily on teaching. This APPE experience will continue to be offered by the off-campus faculty preceptor in the future. Other PP faculty will continue to offer an academic APPE where the preceptor and students are physically in the same region. Because this APPE was successfully provided via videoconferencing, in 2016, the faculty preceptor also began co-precepting via distance another academic APPE previously led by a different PP faculty member in a clinical education region.

Limitations of this study include the small number of students who participated in the APPE. Few students are

interested in exposure to a career in academia during APPEs, and some students may be hesitant about participating in a videoconference experience. Because of the low sample size, only descriptive results were reported. Additionally, in surveys, negative aspects of the APPE may be under-reported because of social desirability bias. Since the APPE was conducted on a one-to-one or two-to-one ratio, students may not have provided negative comments of the APPE on surveys so as to please the instructor and not be identified in student evaluations. The faculty preceptor and experiential administration feedback was subjective in nature. Lastly, extrapolation to other schools that have one campus and all APPEs occurring in the same area may be difficult and may not have a need for distance-based APPEs.

CONCLUSION

An academic APPE elective was successfully designed and taught via videoconference to APPE students over three academic years. The APPE design was effective despite the students and faculty preceptor not being at the same location or on campus. Using videoconferencing allows for more flexibility in designing APPEs. This APPE increased students' perceptions of their knowledge and understanding of academia as a pharmacy career. This experience affords students the opportunity to pursue personal interests and adds to the variety of APPEs offered by the school. In addition, this APPE elective allows students to learn about careers in academic pharmacy, an area of growing need in the pharmacy profession.

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