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PROGRAMME DESCRIPTION

Are you ready to rotate? A one-week intensive Advanced Pharmacy Practice Experiences (APPE) orientation course

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Abstract

Objective: To describe an innovative, one-week, required course designed to prepare students for advanced pharmacy practice experiences (APPEs) and provide professional development resources. **Methods**: Course activities focused on orienting students to APPE expectations and mimicked APPE activities. Students completed a pre- and post-self-assessment of comfort level with APPE activities and expectations. A voluntary survey was provided nine months into APPEs to determine the impact of course content. **Results:** Self-assessment scores statistically improved on all domains assessed. Evaluating a formal patient presentation, preparing an in-service assignment, and conducting a literature search had the greatest improvement in comfort level. In the follow-up survey, the introductory email to preceptor, literature search, and drug information resources and triaging patient care questions were most effective in improving their APPE preparedness. **Conclusion**: A comprehensive APPE orientation and professional development course improved student confidence for APPEs. A follow-up survey completed during APPEs suggests continuing value of course activities.

Introduction

Student pharmacist readiness to enter the Advanced Pharmacy Practice Experiences (APPEs) is a goal of pre-APPE curricula (didactic and introductory pharmacy practice experiences (IPPEs)). The Accreditation Council of Pharmacy Education (ACPE) Standards 2016 (ACPE, 2015) define student readiness as 'APPE-ready', 'practice-ready' and 'team-ready'. Readiness includes: knowledge, skills, attitudes, values and behaviours. Expectations of student pharmacists during APPEs must be clearly outlined. In order to meet standards for APPE readiness required by the ACPE, schools use various methods of orienting and preparing student pharmacists for APPEs including capstone courses (Conway & Ahmen, 2012; Guirguis *et al.*, 2020; Hirsch & Parihar, 2014; Lee *et al.*, 2014; Phillips *et al.*, 2019), standardised patient simulations (Ragan *et al.*, 2013; Vyas *et al*., 2012), elective courses (Gonzalvo *et al.*, 2014; Schellhase *et al.*, 2013), active learning sessions (Clauson *et al.*, 2019), online transition modules (Tchen *et al.*, 2018), IPPE rotations (Gilliam *et al*., 2017; Mort *et al.*, 2010), patient care experiences courses (Barrickman *et al.*, 2020), a simulated APPE didactic course (Hardy & Marshall, 2017), a case-based interactive assessment (Kelley *et al.*, 2008), and mixed methods approaches (Mèszáros *et al.*, 2009).

Prior to the 2019-2020 academic year, in lieu of a formal APPE orientation course, the experiential education office

at the authors college of pharmacy provided mandatory APPE orientation to third-year student pharmacy students (P3) in three to four two-hour sessions (live and recorded) scheduled during the last few weeks of spring term. The orientation sessions included discussions of APPE policies and procedures, the APPE curriculum, professional expectations, and presentation and writing assignment requirements for the fourth professional (P4) year. These sessions were mandatory but were not included as part of a course. It was somewhat difficult to hold student attention during these sessions, particularly if there were upcoming assignments or examinations for concurrent courses. In the new practice-ready curriculum (PRC), faculty developed a week-long course in the P3 spring semester (first taught in April 2020) to provide students with a comprehensive orientation to APPEs by reinforcing and assessing competencies related to the APPEs core activities. The intent of the new course was to enhance student confidence and preparation for APPEs and their future career. Two notable differences from previous APPE orientations include: 1) this weeklong course is provided at the end of their P3 coursework, which is approximately one month before APPEs begin, and 2) a course grade is now assigned. The purpose of this study was to describe the development, implementation, and outcomes of an innovative, one-week, required P3 course designed to comprehensively orient students for APPEs and provide professional development resources.

Methods

Description of the course

In 2017, a new PRC was implemented at the authors college of pharmacy, Auburn University Harrison College of Pharmacy in America. The PRC was designed for students to learn the skills, knowledge, attitudes, and experiences necessary to become 'Practice-Ready' and 'Team-Ready' pharmacists upon graduation. Ability based outcomes (ABOs) were established for the PRC, and competencies were developed for the entire curriculum. Competencies were then mapped to each course in a backwards design methodology. Following this, objectives for each course were developed based on the competencies. The PRC provides a professional learning environment that encompasses active learning through a series of integrated courses and workshops, as well as a variety of focused electives. The workshops are one-week, intensive courses integrated throughout the curriculum, at times when students are not enrolled in other coursework. As students progress through the curriculum, the knowledge and skills gained in earlier courses are built upon so that they advance in both theoretical knowledge and patient-centred clinical application toward competencies that are assessed to ensure students are practice-ready.

'APPE Orientation and Career Preparation', a one credit hour course, was taught at the end of the P3 Spring term, before starting the P4 year. During this time, students were enrolled only in this intensive one-week course and were in the classroom for approximately 24 hours. ABOs were mapped to competencies assigned to this course and were also mapped to Entrustable Professional Activities (EPAs) in preparation for the P4 year (Table I). The course reinforced previously taught competencies related to the patient work-up process, drug information (DI) resources, literature search strategies, communication with patients and other healthcare providers, and core activities of the P4 experiential year. Professional behaviour, leadership, and professional development competencies were also reinforced. The first course offering was taught virtually via video conference with all faculty and participants in individual locations due to the suspension of on-site, live instruction during the COVID19 pandemic. The course was team taught by four pharmacy practice faculty, two professional staff members, and one associate professor who serves as the health sciences librarian.

The course was divided into five units (Table II). All units incorporated active learning strategies and required students to complete assignments outside of class. Audience polling software (Poll Everywhere) was utilised to conduct in-class polls. Student participation in the in-class polls was voluntary and counted towards the students' participation points for the course. Small group virtual breakout rooms and paired peer assessments were used for some discussions and assignments. Course assignments and the grading strategy are outlined in Table II. Points were deducted for late submissions or assignments that were not submitted.

As part of the course, students completed a pre- and post-self-assessment related to their comfort level with tasks and behaviours expected of a P4 student. This was developed by the course instructors from the objectives for the course, which were directly linked to the PRC competencies. The assessment was planned as part of the course, and was not previously validated. Students completed the 34-item self-assessment prior to the first day of instruction and again after completion of the course to determine if there was a change in students' perception of their readiness for APPEs. The goal of the activity was to promote self-assessment and reflection on preparation for

Table I: APPE Orientation and career preparation course competencies mapped to Auburn University Harrison College of Pharmacy's ability-based outcome domains and entrustable professional activity domains

APPE orientation and career preparation course competencies	Ability-Based Outcome domain†	Entrustable Professional Activity domain*
Collect Information		
Identify pertinent information to gather Discriminate between pertinent and extraneous information Utilise technology to obtain patient specific information Organise pertinent information	1, 6, 7	1, 2, 3, 4, 5
Assessment		
Determine the appropriate subjective and objective information needed to formulate an assessment Formulate an assessment using subjective and objective information Interpret lab values and physical findings	1, 8	1, 2, 3, 4, 5
Plan		
Select drug therapy taking into consideration socioeconomic issues (consider formulary, generic, cost-saving recommendations)	1, 4	1, 2, 3, 4, 5
Communication		
Demonstrate appropriate communication skills with healthcare providers Utilise appropriate communication style for patients/audience/situation Communicate professionally (language, demeanour, social media) Utilise professional phraseology Modify education to patient or professional specific factors including barriers Demonstrate effective presentation skills Demonstrate organised and effective written communication Document patient care activities utilising technology or manner appropriate for institution	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6
Drug Information and Evidence Based Medicine		
Utilise resources for drugs and diseases which are appropriate to the question or learning need Analyse a medication or disease related problem in terms of a question to be answered with available evidence Construct an effective search of available literature (databases, primary literature)	1, 2, 3, 4, 5, 6, 8	1, 2, 3, 4, 5, 6
Management		
Practice within the current laws and regulations Comply with accreditation standards where appropriate	1, 4, 6, 7	1, 2, 3, 4, 5
Leadership		
Conduct self-assessments Self-assess leadership skills to identify how to improve weaknesses and deficiencies	5, 9, 10	1, 2, 3, 4, 5, 6
Team Skills		
Demonstrate respect for other healthcare professionals (disciplines)	1, 5	1, 2, 3, 4, 5
Professionalism		
Classify decisions and behaviours as ethical and unethical	10	1, 2, 3, 4, 5, 6
Professional Development		
Identify strategies to achieve personal and professional goals Modify the continuous professional development plan Modify personal and professional goals as needed	2, 10	1, 4, 5, 6

†College's Ability-based Outcome Domains: 1. Provide direct patient care, 2. Provide evidence-based pharmacotherapy services, 3. Serve as a health educator, 4. Optimise clinical, economic, and humanistic outcomes, 5. Function within an interprofessional team, 6. Distribute medications safely and effectively, 7. Manage pharmacy practice, 8. Provide preventative health & wellness services, 9. Change healthcare environment/advocacy, 10. Personal and professional development

*Entrustable Professional Activity Domains: 1. Patient care provider, 2. Interprofessional team member, 3. Population health promoter, 4. Information master, 5. Practice manager, 6. Self-developer

APPE=Advanced Pharmacy Practice Experience

Table II: Course Units, Objectives, Activities, and Assignments

Unit (Class time)	Objectives	Active learning activities	Graded assignments	Mandatory ungraded assignments
1: Professional Behaviour (three hours)	1. Describe potential errors from the use of unapproved abbreviations. 2. Identify potential errors and unapproved abbreviations. 3. Describe how professional and unprofessional behaviours can positively or negatively impact relationships within the interprofessional team. 4. Identify violations of HIPAA in scenarios related to pharmacy practice. 5. Discuss consequences of HIPAA violations during APPEs and in professional practice. 6. Classify decisions and behaviours as ethical or unethical. 7. Describe how unethical decisions by students or pharmacists can impact patient care. 8. Describe how unethical decisions can negatively impact a pharmacist's licensure.	—	Unapproved abbreviations worksheet	Presentations and writing assignments orientation module with quiz HIPAA training Blood Borne Pathogen training
2: Professional Communication (three hours)	1. Describe how communication skills (verbal, non-verbal, and written) can positively or negatively impact professional relationships within the interprofessional team. 2. Identify examples of jargon/lingo (e.g., correctly say 'B-U-N' verses saying 'bun,' etc.) that should be avoided in the professional practice setting. 3. Identify styles of communication (e.g., confrontational, judgmental, slang, etc.) that should be avoided in the professional practice setting. 4. Discuss how to modify patient education depending on their health literacy level. 5. Discuss how to modify education (e.g., results of a study) for patients versus health care professionals. 6. Discuss how to modify education for different health care professionals.	Professional communication with patients and health care providers role play	Introduction email to APPE preceptor with peer review	—
3: Patient Workup (six hours)	1. Define what is meant by 'working up a patient.' 2. Describe the general process of working up a patient. 3. Compare and contrast the patient work up process in inpatient versus outpatient settings. 4. Describe the relationship between the patient work up process and the Pharmacists' Patient Care Process. 5. Describe the process of formulating a comprehensive assessment and plan from information collected in the patient work up. 6. Effectively organise written information in a patient work up. 7. Simulate verbally presenting a patient work up to a preceptor. 8. Appropriately document patient care activities and interventions.	Small group discussion utilising guided questions to: 1. Compare and contrast the inpatient and outpatient workup 2. Discuss video examples of verbal patient presentations to a preceptor 3. Interactive lecture on documenting clinical interventions in Quantifi	Inpatient and outpatient work-up of patient chart using provided forms	Evaluation of videos of patient presentations to preceptor Peer evaluation of patient work-up presentations
4: Drug Information Analysis and Literature Search (seven hours)	1. Distinguish reputable versus non-reputable drug information resources. 2. Identify a personalised list of resources to use on APPEs. 3. Determine when a comprehensive search is needed versus a quick response based on the practice scenario. 4. Given a patient scenario, formulate at least one clinical question using the PICO Method. 5. Design a search strategy including keywords and filters to answer a question based on a given patient case. 6. Conduct a comprehensive search to answer a clinical patient care question. 7. Evaluate the presentation skills of a student formal patient presentation using the corresponding APPE rubric.	In-class polling questions to determine how to triage patient care questions when on rounds/in clinic Think-Pair-Share for developing a clinical question Large group discussion of P4 formal patient presentation video	Two-part literature search strategy assignment Evaluation of video of formal patient presentation	Develop a table of drug information resources
5: Professional Development (seven hours)	1. Identify professional development opportunities that align with your career path. 2. Modify your personal and professional goals to promote self-care and work-life integration throughout school and your career. 3. Develop a strategy to stay up-to-date with current literature/ practice issues/ continuing education for life-long learning. 4. Use the APPE Readiness Self-Assessment form to determine areas of strengths and improvement. 5. Describe the process of obtaining pharmacist licensures in various given states.	Preceptor panel discussion P4 student panel discussion	Identify board of pharmacy requirements in assigned states Peer review of CV	Ten lessons learned reflection

HIPAA = Health Insurance Portability and Accountability Act; APPE = advanced pharmacy practice experiences; PICO: population, intervention, control, and outcomes; NAPLEX = North American Pharmacist Licensure Examination; P4 = fourth professional year; CV = curriculum vitae

APPEs. Students rated their level of comfort on each of the 34 domains using a 4-point Likert scale: 'not comfortable at all' (1), 'somewhat comfortable' (2), 'comfortable' (3), or 'very comfortable' (4). The pre- and post-self-assessments were graded for submission and completeness.

A standard voluntary course evaluation was made available to students after each course in the PRC. This was developed to supplement formal university teaching evaluations and gather more specific data. This evaluation form assessed if students were able to make a connection between class activities and expectations for the APPE year, as well as if unit assignments were helpful in preparing for APPEs. Students reported whether specific assignments and peer assessments were useful using a 5-point Likert scale from 1 (not helpful) to 5 (very helpful).

Finally, a second voluntary follow-up course evaluation was sent to students approximately half-way through their P4 year to assess the effectiveness of the P3 course in preparing them for APPEs. Students were asked to rate the effectiveness of the activities and assignments included in the course from 1 (not effective at all) to 5 (extremely effective).

All the assessments and outcomes described above were designed for student assessment, grading, and quality improvements and were collected as part of the course. The assessments were developed, tested, and edited by a group of pharmacy practice and experiential faculty and staff who were involved in the delivery of the course. After the course was completed, a retrospective study was conducted evaluating the existing educational data. Statistical analysis was conducted using GraphPad Prism (Version 6.04 for Windows). Descriptive statistics were used to analyse results from in-class polls, student assignments, and follow-up surveys. Median results are reported with the interquartile range (IQR). Mean results are reported as mean ± standard deviation. Changes in the median self-assessment scores from pre- to post-course were assessed using the Wilcoxon paired signed-rank test. Fisher's exact test was utilised to analyse categorical data. A *p*-value of less than 0.05 was considered significant. This study was reviewed and approved by Auburn University's Institutional Review Board.

Evaluation

152 students (100%) enrolled in the spring 2020 course completed the pre- and post-course self-assessments. Prior to enrollment in this P3 course all students had completed three IPPE rotations, of which two were patient care focused and had introduced them to APPE rotations. For the patient care IPPE rotations, 48.7% (74/152) of students completed an IPPE in an inpatient setting, and 51.3% (78/152) in an outpatient setting.

A statistically significant difference was found in the median scores rated by the students in each of the self-assessment tasks and behaviours evaluated by the pre- and post- self-assessment (Table III). Evaluating a formal patient presentation, preparing an in-service assignment, and conducting a literature search had the greatest improvement in comfort level scores on the post-survey. Students reported high levels of comfort on both the pre- and post-self-assessments for the categories of professional appearance, punctuality, dependability, respect for others, accepting and understanding responsibility for assigned tasks, and understand/is compliant with policies and procedures of the Experiential Programs Office. In the remaining categories, there was a significant increase in the number of students who reported feeling 'comfortable' or 'very comfortable' after completing the course (Table IV). Students stated they felt more prepared to start APPEs following completion of the course (pre-assessment 3 [2-3] versus post-assessment 3 [3-4]; $p < .001$).

Overall, students performed well in the course. All students (n = 152) completed each assignment. Student performance is summarised in Table V. 144 (94.7%) of the students earned an 'A' grade in the course. Eight students (5.3%) earned a 'B'. No students earned below a 'B' or were required to complete remediation for the course. The average grade was a 95.9% ± 3.0.

Immediately after the course, 44 students (28.9%) provided their perspectives of the course in a voluntary survey. The majority of student respondents (86.4%) stated they made a connection between the course activities and the core expectations of the APPE year. Listening to the P4 student panel discussion and asking questions assisted in making these connections. The preceptor panel activity and patient workup form assignment were the highest ranked activity or assessment in preparing the students to achieve course learning objectives. The P4 student panel activity, literature search strategies activity, and unapproved abbreviations activity followed in ranking. The Board of Pharmacy state licensure activity was ranked the least helpful. Students were asked to submit at least three understandings or core principles learned in the course. Learning how to complete a patient workup, the use of DI resources, curriculum vitae (CV) information, unapproved abbreviations, professionalism, and communication were themes identified in the student responses. Students stated the literature search strategies, patient work-up,

Table III: Change in student comfort level with activities and expectations associated with APPE experiences before and after the pre-APPE and career preparation course (n = 152)

Item	Pre-assessment score, median [IQR]	Post-assessment score, median [IQR]	*p* value
Demonstrate professional appearance	4 [4-4]	4 [4-4]	0.006
Demonstrate punctuality	4 [4-4]	4 [4-4]	0.001
Demonstrate dependability	4 [4-4]	4 [4-4]	0.031
Demonstrate legal & ethical decision making	4 [3-4]	4 [3-4]	<0.001
Demonstrate respect for others	4 [4-4]	4 [4-4]	0.009
Accept responsibility for assigned tasks	4 [4-4]	4 [4-4]	0.002
Accept constructive feedback and incorporate recommendations	4 [3-4]	4 [4-4]	<0.001
Demonstrate leadership skills	3 [3-4]	4 [3-4]	<0.001
Demonstrate self-directed learning	3 [3-4]	4 [3-4]	<0.001
Self-identify knowledge of skills and abilities that could limit or enhance personal or professional growth	3 [3-4]	4 [3-4]	<0.001
Demonstrate professional communication via email	4 [3-4]	4 [4-4]	<0.001
Demonstrate professional communication with other healthcare professionals	4 [3-4]	4 [4-4]	<0.001
Demonstrate professional communication with patients and/or care givers	4 [3-4]	4 [4-4]	<0.001
Understand HIPAA and patient privacy	4 [3-4]	4 [4-4]	<0.001
Understand processes to prevent exposure to blood borne pathogens	4 [3-4]	4 [4-4]	<0.001
Understand expectations of me as a P4 student pharmacist	3 [3-4]	4 [4-4]	<0.001
Understand/is compliant with policies and procedures of the Experiential Programs Office (EPO)	3.5 [3-4]	4 [4-4]	<0.001
Perform an inpatient workup	3 [2-3]	3 [3-3]	<0.001
Perform an outpatient workup	3 [2-3]	3 [3-4]	<0.001
Peer review an assignment or activity	3 [2-4]	4 [3-4]	<0.001
Document patient care interventions	3 [2-3]	3 [3-4]	<0.001
Think on your feet to answer a drug information question from a preceptor or provider	2 [2-3]	3 [3-4]	<0.001
Identify resources to answer drug information questions	3 [3-4]	4 [3-4]	<0.001
Distinguish between reputable and non-reputable drug information resources	3 [3-4]	4 [3-4]	<0.001
Develop a clinical question about a patient	3 [2-4]	3.5 [3-4]	<0.001
Design a literature search strategy for a clinical question	3 [2-3]	4 [3-4]	<0.001
Conduct a literature search in PubMed	3 [2-3]	4 [3-4]	<0.001
Prepare a formal patient presentation	3 [2-3]	3 [3-4]	<0.001
Verbally present a formal patient presentation	3 [2-3]	3 [3-4]	<0.001
Evaluate a formal patient presentation	2 [2-3]	3 [3-4]	<0.001
Prepare a journal club presentation	3 [2-3]	3 [3-4]	<0.001
Prepare a writing assignment	3 [2-3]	3 [3-4]	<0.001
Prepare an in-service assignment	2 [2-3]	3 [3-4]	<0.001
Overall, what is your comfort level on preparation to start APPE rotations	3 [2-3]	3 [3-4]	<0.001

IQR = Interquartile Range

evaluating a patient presentation, and peer review of a CV activities solidified these understandings. Students positively commented on having the opportunity to complete an inpatient and outpatient patient workup and learn from the pharmacy librarian how to perform a literature search.

In the follow-up survey during the APPE year (response rate = 71/152, 46.7%), students ranked (1 = not effective at all, 5 = extremely effective) the following course activities or assignments as the top three most effective in improving their preparedness for APPEs: individual introduction email to preceptor assignment (3.98/5), two-part literature search strategies activity (3.83/5), and

Table IV: Comparison of students self-assessment ratings of 'Comfortable' or 'Very Comfortable' before and after the pre-APPE and career preparation course (n = 152)

Item	Pre-assessment score of 3-4, Comfortable or Very Comfortable, N (%)	Post-assessment score of 3-4, Comfortable or Very Comfortable, N (%)	*p* value
Demonstrate professional appearance	148 (97.4)	152 (100)	0.1225
Demonstrate punctuality	150 (98.7)	152 (100)	0.4983
Demonstrate dependability	149 (98.0)	151 (99.3)	0.6225
Demonstrate legal & ethical decision making	133 (87.5)	148 (97.4)	0.0018
Demonstrate respect for others	152 (100)	152 (100)	1.00
Accept responsibility for assigned tasks	148 (97.4)	152 (100)	0.1225
Accept constructive feedback and incorporate recommendations	142 (93.4)	152 (100)	0.0017
Demonstrate leadership skills	128 (84.2)	145 (95.4)	0.002
Demonstrate self-directed learning	131 (86.2)	151 (99.3)	0.0001
Self-identify knowledge of skills and abilities that could limit or enhance personal or professional growth	134 (88.2)	148 (97.4)	0.0031
Demonstrate professional communication via email	106 (69.7)	150 (98.7)	0.0001
Demonstrate professional communication with other healthcare professionals	135 (88.8)	148 (97.4)	0.0054
Demonstrate professional communication with patients and/or care givers	139 (91.4)	150 (98.7)	0.0061
Understand HIPAA and patient privacy	141 (92.8)	152 (100)	0.0008
Understand processes to prevent exposure to blood borne pathogens	139 (91.4)	152 (100)	0.0002
Understand expectations of me as a P4 student pharmacist	119 (78.3)	147 (96.7)	0.0001
Understand/is compliant with policies and procedures of the Experiential Programs Office (EPO)	130 (85.5)	147 (96.7)	0.0791
Perform an inpatient workup	78 (51.3)	122 (80.3)	0.0001
Perform an outpatient workup	85 (55.9)	138 (90.8)	0.0001
Peer review an assignment or activity	112 (73.7)	150 (98.7)	0.0001
Document patient care interventions	97 (63.8)	130 (85.5)	0.0001
Think on your feet to answer a drug information question from a preceptor or provider	71 (46.7)	125 (82.2)	0.0001
Identify resources to answer drug information questions	131 (86.2)	148 (97.4)	0.0006
Distinguish between reputable and non-reputable drug information resources	128 (84.2)	149 (98.0)	0.0001
Develop a clinical question about a patient	108 (71.1)	136 (89.5)	0.0001
Design a literature search strategy for a clinical question	94 (61.8)	140 (92.1)	0.0001
Conduct a literature search in PubMed	101 (66.4)	145 (95.4)	0.0001
Prepare a formal patient presentation	77 (50.7)	125 (82.2)	0.0001
Verbally present a formal patient presentation	83 (54.6)	121 (79.6)	0.0001
Evaluate a formal patient presentation	71 (46.7)	140 (92.1)	0.0001
Prepare a journal club presentation	82 (53.9)	122 (80.3)	0.0001
Prepare a writing assignment	90 (59.2)	134 (88.2)	0.0001
Prepare an in-service assignment	63 (41.4)	119 (78.3)	0.0001
Overall, what is your comfort level on preparation to start APPE rotations	108 (71.1)	140 (92.1)	0.0001

triaging the acuity of patient care questions during rounds/clinic (3.76/5). The Board of Pharmacy state licensure activity was ranked the least effective (2.89/5) for improving their preparedness. Overall, 32 students (45.1%) stated the course content was very or extremely relevant for improving their preparedness for APPEs, and 26 students (36.6%) stated the content was relevant. Students referred to the individual introductory email to preceptor assignment, professional writing requirements, and examples of clinical intervention documentation as the most helpful references utilised from the course during APPEs. 20 students provided qualitative feedback regarding the course. The most common suggestion (five

Table V: Summary of student performance in the P3 course (n = 152)

Assignment/Activity	Possible points	Points earned (mean ± SD)
APPE readiness self-assessment pre-survey	50#	49.8 ± 2.0
Presentations and writing assignments orientation module with quiz	*	N/A
HIPAA and blood borne pathogen training	*	N/A
Unapproved abbreviations worksheet	50	43.0 ± 7.0
Introduction email to APPE preceptor with peer review	50	45.8 ± 4.4
Inpatient patient workup	100	90.7 ± 10.2
Outpatient patient workup	100	92.7 ± 8.3
Evaluation of videos of patient presentations to preceptor	*	N/A
Peer evaluation of patient workup presentation	100#	99.3 ± 3.6
Literature search strategy #1	100	96.5 ± 7.4
Literature search strategy #2	50	48.5 ± 3.7
Evaluation of formal patient presentation video	150	144.4 ± 11.8
Development of table of drug information resources	*	N/A
Identification of board of pharmacy requirements in assigned states	50	49.5 ± 0.9
Peer review of CV	100#	99.5 ± 3.4
Ten lessons learned reflection	4#*	3.7 ± 1.0
APPE readiness self-assessment post-survey	50#	49.9 ± 0.7
Participation*	46	45.0 ± 2.3

#Complete/Incomplete
*Included as complete/incomplete within participate points

students) was to incorporate residency preparation content.

The P3 Spring 'APPE Orientation and Career Preparation' Course is the last course of the Doctor of Pharmacy (Pharm.D.) programme prior to APPEs. During the first offering of this course, students performed positively on all assignments and activities. The intent of the course was to orient students to APPEs, reinforce key skills students learned in earlier courses, and provide professional development resources, which are imperative to the success on APPEs. As expected, upon completion of the course, students reported increased comfort with the expectations and activities of the P4 year. Student feedback on the voluntary end-of-course survey supported that course activities aligned with objectives and enhanced student learning as they prepared to enter the P4 year. In the follow-up survey during APPEs, most students reported the course content was very or extremely relevant to prepare them for APPEs. Student feedback from both surveys on assignments led to minor changes in future course iterations.

Many students rated themselves highly on the pre-course self-assessment; yet a statistically significant increase in the change of scores was determined when comparing this to the post-course results. As the last course in the didactic curriculum, students should feel prepared to begin APPEs as they have already completed three IPPEs and all their didactic coursework. However, the addition of a required APPE orientation course provided students with an increased self-reported confidence level and preparedness entering APPEs. In the follow-up survey, students noted they referred to course material related more to policies and procedures versus clinical skills or critical thinking activities. Therefore, inclusion of these resources appeared to be a valuable addition to student activities, rather than solely focusing on clinical skills that are described previously in other 'capstone' or similar courses to prepare students for APPEs.

When comparing this course to other published courses designed to prepare students for APPEs (Barrickman *et al.*, 2020; Clauson *et al*., 2019; Gilliam *et al.*, 2017; Guirguis *et al*., 2020; Hardy & Marshall, 2017; Phillips *et al*., 2019), this course focused mainly on expectations and behaviours of students and patient care processes rather than specific therapeutic knowledge and clinical application. Other studies discuss innovative ways to assess student preparedness for APPEs, however, the course described in this study is unique in its focus on orientating students to required aspects of APPEs in order to improve their preparedness, success, and professional development. Additionally, several of the studies describe term(s) long courses in the P3 year (Barrickman *et al*., 2020; Guirguis *et al.*, 2020; Phillips *et al*., 2019) whereas this was a one-week intensive course, which could be easier to adapt into other school of pharmacy curricula. Like this study, other evaluations assessed student confidence (pre- and post-course) (Barrickman *et al.*, 2020; Guirguis *et al*., 2020; Hardy & Marshall, 2017; Phillips *et al.*, 2019) with three (Guirguis *et al.*, 2020; Hardy & Marshall, 2017; Phillips *et al.*, 2019) of the four studies also demonstrating improved student self-confidence prior to APPEs with their approach. Tchen and colleagues (2018) described required modules on topics that were similar to this study's activities (orientation to APPEs, electronic medical record, and patient work-up), but these were self-paced online modules and focused on inpatient practice experience. The course described in this study was a more immersive experience intended to orient students to all aspects of APPEs.

Despite the course being designed to be taught in-person in the classroom setting, due to the COVID19 pandemic, it was taught virtually. The course activities and assignments were not altered due to the change in teaching format. Break-out rooms on videoconferencing were utilised for planned group/peer activities. The authors school has a

main and satellite campus, so faculty were comfortable teaching via videoconference. All students had completed five weeks of classes via videoconferencing prior to beginning this course. Future iterations of the course are planned to be taught in person; however, the remote delivery of the course did not appear to impair content delivery or student learning,

While there are notable benefits to improving student preparedness for APPEs through a focused course, limitations exist for these course analyses. First, this was a retrospective study of one student cohort from a single college of pharmacy. The outcomes collected were subjective and based on student opinions. As expected, many students rated themselves highly on the pre-course self-assessment as they had been introduced and exposed to these competencies prior to the course. However, a change was still identified when compared to post-self-assessment. The voluntary student course evaluation had a low response rate (28.9%), which is common for the authors college's courses. The follow-up survey had a higher (46.7%) response rate; however, feedback from these evaluations may not be representative of all students. Finally, the results of student performance in APPEs were not collected and compared to previous years. However, given the implementation of a new curriculum, many other factors may have influenced a potential change in performance for the current class of students compared to student graduates of the previous Pharm.D. curriculum. Additionally, the course objectives and competencies were mapped to EPAs used to evaluate students on APPEs, leading to confidence that the course aligned with activities, goals, and outcomes pertinent to the P4 year .

Future plans

A comprehensive APPE orientation course taught at the end of the P3 academic year reinforced and assessed competencies related to the P4 year, ultimately enhancing student level of comfort and preparation for APPEs. Students may have overestimated their preparation for APPEs through self-assessment; however, the follow-up survey completed during the APPEs suggests the continuing value of course activities. Schools of pharmacy with APPE readiness courses should consider incorporating orientation to APPEs and professional development into the curriculum, rather than only focusing on clinical abilities. Future evaluations examining course impact on student performance during APPEs should be investigated.

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