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Evaluation of a Newly Established Layered Learning Model in an Ambulatory Care Practice Setting

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ABSTRACT

Background and Purpose: Given the need to accommodate overlapping longitudinal Introductory Pharmacy Practice Experience (IPPE) students and Advanced Pharmacy Practice Experience (APPE) students at regular intervals while meeting clinical demands, the opportunity to establish a layered learning model (LLM) became evident at University of Missouri - Kansas City School of Pharmacy. The purpose of this project was to establish an LLM at an ambulatory care site, observe the teaching-learning interactions between IPPE and APPE students, and evaluate student perceptions of the experience.

Educational Activity and Setting: The LLM was implemented over the course of three traditional semesters during Spring 2016 through Spring 2017. Clinical services were offered 2.5 days per week. Overlapping student instructional time was established in conjunction with the provision of clinical pharmacy services and the structure of each rotation type. Third-year (P3) IPPE and fourth-year (P4) APPE students, who participated in the LLM at this site, completed a course evaluation pertaining to their experiences. The evaluation focused on APPE and practice readiness, as well as strengths and limitations of the LLM.

Findings: All 16 students completed the evaluation (100% response rate). All IPPE students indicated the LLM prepared them for APPEs in either an excellent (n=3, 37.5%) or above average (n=5, 62.5%) manner. Of the APPE students, most indicated the LLM prepared IPPE students for APPEs in an excellent (n=3, 37.5%) or above average (n=4, 50%) manner. Similarly, the majority of APPE students indicated the LLM prepared APPE students for practice in an excellent (n=3, 37.5%) or above average (n=5, 62.5%) manner. In addition, the following common themes developed, which highlight the benefits of the experience: reinforcement of knowledge through instruction, enhanced understanding of APPE expectations, exposure to multiple teaching styles, and creation of a comfortable learning environment. Students suggested the LLM include increased time for interaction with other learners.

Summary: An LLM involving P3 IPPE and P4 APPE pharmacy students, in an ambulatory care practice setting, was associated with positive student perceptions. Student feedback was best utilized to generate the hypothesis that this LLM may increase both APPE and practice readiness. However, further study is needed to confirm direct cause and effect.

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Background and Purpose

Through the provision of Introductory Pharmacy Practice Experiences (IPPEs) and Advanced Pharmacy Practice Experiences (APPEs), administrators, faculty, and adjunct preceptors continually contemplate the most effective manner to maximize experiential education while balancing a demanding workload. Thus, it becomes increasingly important to consider how to manage all responsibilities while ensuring students receive a progressive and extensive education. This challenge continues as enrollment in Pharm.D. programs at Schools and Colleges of Pharmacy in our country remains steady, with the experiential program comprising at least 30% of the curriculum.^{1,2} Instructional methods, such as the Layered Learning Model (LLM), may facilitate successful achievement of these expectations for both preceptors and learners.

The LLM allows multiple learners at various levels of instruction to educate, and actively learn from each other, under the direction of a pharmacist preceptor. Pinelli, et al. sought to identify the optimal conditions for an LLM in hospital and health-system pharmacy practice settings. The authors identified seven key attributes needed to create and execute this instructional model: shared leadership, a systematic approach, good communication, flexibility for attending pharmacist, adequate resources, commitment, and evaluation.³ It is important to continually reflect upon these attributes when developing an LLM, to ensure optimal design and quality assurance. Historically, this instructional method has included an attending pharmacist, postgraduate year 1 (PGY-1) or postgraduate year 2 (PGY-2) pharmacy resident, APPE student(s) and/or IPPE student(s).⁴⁻¹¹

Peer teaching models have a well-established role in medical education.¹²⁻¹⁴ The benefits of this instructional model have also extended into pharmacy education and the provision of clinical pharmacy services. Available literature has discussed the gains achieved through the LLM as an extension of pharmacy services.^{4,5,7,8,15,16} In addition, improved clinical time management for learners,⁶ positive effects on institutional metrics,^{5,7} and increased provision of patient care experiences for pharmacy students have all been observed.^{4-7,11,16-18} However, emphasis on the teaching-learning component between students (near-peer instruction) in the LLM remains essential. Studies have evaluated varying aspects of near-peer instruction,^{16,19} yet the literature is generally more robust for an LLM including residents as one of the key players.³⁻¹¹ Research appears to be more limited where the instructional relationship is specifically between IPPE and APPE students.^{16,17,20}

The LLM has historically received more attention in the acute care setting, as opposed to ambulatory care.^{3,5-8,16,17} However, a variety of initiatives aspire to develop a consistent model of practice across diverse pharmacy practice settings.²¹⁻²³ Additionally, Pinelli et al. have outlined an encouraging educational framework for immersing learners in an LLM through the use of cognitive apprenticeship. This framework for LLMs would theoretically be transferrable to any pharmacy practice environment and offer consistency as well.²⁴ However, unique logistical considerations are present in the ambulatory care setting. Therefore, best practices for the establishment of LLMs in ambulatory care are prudent.

At the University of Missouri-Kansas City (UMKC) School of Pharmacy, third-year (P3) students participate in a longitudinal IPPE course during the Fall and Spring semesters. The course requires 90 hours of direct patient care, or related activities. Students are placed with the same faculty member throughout the course for observation of continuity of care. The course performance competencies are directly mapped to the Pre-APPE Core Domains in the ACPE "Guidance for Standards 2016."²⁵ During the same academic year, faculty members may have fourth-year (P4) APPE students assigned to them. For ambulatory care faculty, the duration of APPEs may be one or two calendar months. APPEs require 160 hours of direct patient care activities per calendar month.

UMKC School of Pharmacy employs one faculty member who maintains an ambulatory care practice at the Harry S. Truman Memorial Veterans' Hospital (Truman VA). The faculty member independently provides direct patient care in the management of various chronic disease states, with the most common disease states being diabetes, hypertension, smoking cessation, dyslipidemia, and anticoagulation. Patient encounters occur both in clinic and by telephone. The faculty member is responsible for an average of 15-20 patient encounters over 2.5 days per week. Given the need to accommodate overlapping IPPE and APPE students at regular intervals while meeting clinic demands, the opportunity to engage in the establishment of an LLM became evident.

Ideally, an LLM effectively prepares IPPE students for APPE experiences (i.e. APPE readiness), prepares APPE students for practice (i.e. practice readiness), and maximizes faculty resources. Enhancing achievement of applicable 2013 Center for Advancement of Pharmacy Education (CAPE) Educational Outcomes while recognizing the newly established AACP Entrustable Professional Activities for New Pharmacy Graduates (EPAs) becomes paramount in this process.^{26,27} The purpose of this project was to establish an LLM at an ambulatory care site, observe the teaching-learning interactions between IPPE and APPE students, and evaluate student perceptions of the experience.

Educational Activity and Setting

The LLM at the Truman VA was implemented over the course of three traditional semesters, during the spring of 2016 through the spring of 2017. The learners involved in the LLM were P3 IPPE (n = 8) and P4 APPE students (n = 8). APPE students were continuously present at the practice site over the course of their rotation. However, each IPPE student was only present one-half day every other week, on days when clinical pharmacy services were available. Each level of learner was paired and assigned patient care duties appropriate for their abilities. The specific time frames for learner overlap are outlined in [Table 1](#). IPPE students 1-3 had exposure to one set of APPE students over two months, while IPPE students 4-8 had exposure to three sets of APPE students over five months. When both types of students were present at the clinical site, each IPPE student spent approximately 8-10 hours per month with APPE students. The IPPE schedule varied throughout each semester, with some IPPE students attending alone or in pairs. As a result, overlap for each APPE student was approximately 25-30 hours per month.

To prepare APPE students to take on a teaching role, the faculty preceptor provided an informal explanation of their

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