



Design, implementation, and assessment of an Integrated Pharmacy Applications course series

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Abstract

The McWhorter School of Pharmacy implemented a new curriculum in 2009 that sought to integrate information horizontally and vertically throughout the entire curriculum. A six-semester Integrated Pharmacy Applications (IPA) course series was designed to accomplish this. The objective of this article is to describe the design, implementation, and assessment of the integrated applications course sequence. Each semester of the didactic curriculum contains a one-credit-hour IPA course. The course has a weekly laboratory component and a two-hour time block on Fridays for discussion sessions. A framework for developing and facilitating sessions was created and provided to faculty. Example sessions include increasingly complex patient case discussion, technique demonstration, and simulations. Friday discussion sessions are designed to illustrate application of didactic course content to direct patient care. Students are charged a laboratory fee each semester to provide funds necessary to purchase supplies and equipment. The course series was implemented over a period of three years. An administrative position was created to oversee the series and ensure assessment of curricular integration efforts. Course topics are selected by this person in collaboration with faculty. Assessment of student performance in the course is formative and includes rubrics for direct observations, case notes, care plans, group work, and reflections. Course evaluations and student focus groups are used to obtain student feedback about the course. Deliberate planning and coordination of the IPA course series has fostered maximization of student learning, achievement of curricular integration, and compliance with accreditation standards.

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Introduction

Curricular evaluation and integration are some of the most challenging endeavors in all of the educational enterprise. The McWhorter School of Pharmacy embarked on this journey and, subsequently, implemented a new

curriculum in Fall 2009. During the revision process, the Curriculum Committee (CC) sought to reduce redundancy, balance each semester's credit load, and better integrate information throughout the entire curriculum. Course content and sequencing was developed based upon interdisciplinary workgroups to ensure topical integration. Furthermore, each course was reviewed or developed by a workgroup, presented to the CC, and then approved by the pharmacy faculty.

The new curriculum is aptly named "Coordinated Topics with Integrated Applications: A Patient-Centered Approach

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Focusing on Drug-Related Problems and Pharmacy Applications.” To accomplish this theme, the revised curriculum includes a six-semester course series titled Integrated Pharmacy Applications (IPA) I–VI. This course sequence is designed to integrate content both horizontally and vertically throughout the first three years of the curriculum.

The Accreditation Council for Pharmacy Education (ACPE) stated in their 2011 Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree that the curriculum must be integrated in some fashion.¹ Standard 11 states that “the college or school, throughout the curriculum and in all program pathways, must use and integrate teaching and learning methods that have been shown through curricular assessments to produce graduates who become competent pharmacists by ensuring the achievement of the stated outcomes, fostering the development and maturation of critical thinking and problem-solving skills, meeting the diverse learning needs of students, and enabling students to transition from dependent to active, self-directed, lifelong learners.”¹ Additionally, Standard 13 states that “knowledge, practice skills, and professional attitudes and values must be integrated and applied, reinforced, and advanced throughout the curriculum, including the pharmacy practice experiences.”¹ To accomplish this desired integration, the CC designed this course series to provide a mechanism by which content can truly be applied, reinforced, and advanced throughout the new curriculum. In general, the approach to integrating course material and applying it to patients is initially foundational and becomes more complex as students advance in the program.

A search of the literature located a small number of articles describing integrated courses or activities.^{2–8} For example, an integrated exercise involving ways biochemistry relates to patient care has been described.² Students who participated in this session noted that it aided their ability to integrate pharmacy practice and basic science concepts. Additionally, a web-based simulation exercise in a laboratory series occurring during the first three years of the pharmacy curriculum has been noted.³ “This Integrated Lab series provides for a weekly active learning environment for students combining experiences like sterile and nonsterile compounding; case studies; prescription dispensing; role plays and computerized simulations which change depending on the didactic coursework running concurrently. Faculty involved in teaching core coursework (e.g., pharmaceuticals, pharmacology, and therapeutics) participate in the design and delivery of the labs.”³ Activities from a Japanese medical school in which students design and conduct experiments that integrate their knowledge of physiology and pathophysiology concerning a patient’s situation have also been published.⁷ A Saudi Arabian medical school has utilized integrated block modules to allow students to share and apply their knowledge of biochemistry, pathology, and microbiology.⁸ These examples demonstrate health professional schools across the

world are promoting the integration and application of knowledge with the aim of enhancing the approach to patient care.

Objective

The objective of this article is to describe in detail the design, implementation, and assessment of the IPA course sequence. Examples of course sessions are provided.

Design

Each semester of the three-year didactic curriculum includes a one-credit-hour IPA course. The course is composed of weekly laboratory sessions that meet Monday through Thursday afternoons; a discussion session also meets on several Friday mornings of each semester. For the Monday through Thursday laboratory sessions, each class ($n = 128$ per class) is divided into four sections ($n = 32$ per section), with each section meeting up to three hours, one day per week. The three concurrent IPA sessions ongoing each weekday have been assigned a specific classroom or laboratory space that is equipped to accommodate the learning exercises. The aim of each IPA course is to include ten weekly laboratory sessions, four case-based Friday sessions, and at least two professional development presentations by a guest speaker per semester. Students are randomly assigned to a laboratory section, and small groups of five to ten students within each section are also created. These groups are the same for all courses of that semester. Intentionally forming student groups in this manner aids in their meeting for group projects or assignments and facilitates their getting to know each other better as they integrate knowledge together across their courses.

During the first professional (P1) year, students are enrolled in courses such as Pharmaceutics and Institutional Practice/Sterile Compounding. Therefore, the first two semesters of IPA primarily focus on nonsterile and sterile compounding. With the second professional (P2) and third professional (P3) years, students begin the Pharmaceutical Sciences and Pharmacotherapy sequences. Thus, the remaining four semesters of IPA introduce case-based application, devices, and physical assessment. Each weekly topic integrates with a disease state or concept the students have covered in the didactic setting and provides the student with an opportunity to apply that information to myriads of real-life patient scenarios and drug-related problems. When feasible, laboratory sessions are designed to assist in the preparation of students for introductory pharmacy practice experiences (IPPE). For example, students receive immunization training during the fall of the P2 year. During the fall of the P3 year, students have an immunization refresher week in which guideline updates and clinical scenarios are presented and discussed. At the completion of the session, students have the opportunity to practice injection technique. This session is intentionally placed early in the fall

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