

A Renaissance in Pharmacy Education at the University of North Carolina at Chapel Hill

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The UNC Eshelman School of Pharmacy is transforming its doctor of pharmacy program to emphasize active engagement of students in the classroom, foster scientific inquiry and innovation, and immerse students in patient care early in their education. The admissions process is also being reengineered.

The US health care system is in need of change to improve the quality and delivery of patient care and to reduce health care costs [1]. Numerous calls have emerged for reform in health professions education to better prepare students for the continual improvement of health and health care [2, 3]. To best position students, we must foster habits of inquiry, critical thinking, and innovation and ensure that students are immersed in real-world patient care settings earlier and more often in their education and training. Employers within and outside health care are increasingly seeking inquisitive individuals who are able to think critically, communicate clearly, and work effectively in teams to solve complex problems [4]. All too often, students possess great discipline-specific knowledge but lack the skills essential to survive in an increasingly competitive and global society. Despite evidence suggesting a need for change, little has changed in the way that education is delivered to aspiring health professionals. Lecture continues to prevail in the vast majority of health sciences schools, with minimal time devoted to higher forms of thinking and problem solving. Students are coming to us in a highly digital age where information is a commodity and technologies abound to support student learning. No longer can we assume as faculty that our job is to teach them everything they need to know. We must better prepare students with the skills they will need to positively impact human health and health care. This requires that we change not only what we teach but also how we teach, to better position students for success.

Toward a Curriculum Transformation

The UNC Eshelman School of Pharmacy has a long-standing reputation of providing one of the best pharmacy educations in the world. The school's Educational Renaissance initiative is an integral component of the school's strategic plan, and it speaks to the school's aspirations to transform

education, enlighten students, and advance health care [5].

In summer of 2011, a faculty workgroup was charged with critically examining curricular change. The group outlined a conceptual framework for change, desired program outcomes, defining elements, and guiding principles of a new curriculum (Table 1). Strengths of the existing curriculum were also considered in an effort to capitalize on the successes that already set the school apart. Aside from required fourth-year clinical rotations, differentiating experiences were largely extracurricular or were limited to students or student organizations intrinsically driven to pursue such opportunities; these differentiating experiences included engagement in direct patient care and service learning, leadership opportunities, and hypothesis-driven research or quality improvement-driven inquiry. In many respects, our students were sending us a message about the skills they longed to develop and their potential to do more. This insight and a sound rationale for change formed the foundation for the defining elements of the new curriculum. The workgroup presented its findings to the faculty in May 2012, and 86% of the faculty voted (anonymously) in support of the defining elements of the new curriculum.

The next step was to critically examine the value and feasibility of each of the defining elements. In August 2012 the school's dean charged the Curriculum Transformation Steering Committee (CTSC) with presenting a more detailed proposal of the new curriculum for faculty endorsement in December 2012. Subcommittees were formed to address the following issues: foundational content, immersion in patient care, scientific inquiry and scholarship, technology and pedagogy, assessment of student learning, and admissions. This effort involved more than half of the school's faculty members as well as various partners, staff members, and students.

The committee's work was influenced by prior curricular innovations, particularly in medicine and engineering [6-8]. In addition, the faculty considered the job to be done by

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future graduates of the program. The theory of the “job to be done” is a well-regarded framework described by Clayton Christensen for guiding change and innovation, and its application has been linked to successful transformations [9]. We reflected on the careers that our graduates currently consider (eg, clinical specialists or generalists in university health systems, community hospitals, and community care settings as well as positions in the pharmaceutical and managed care industries, academia, and community/retail practice) as well as the fact that nearly 50% of them pursue postgraduate training opportunities. We considered all of this in light of the job to be done by future graduates in addressing the costly and unmet medication-related needs of patients and society [1], including that of the pharmacist as an integral member of the health care team in providing high-quality, patient-centered care. Although it is impossible

to predict the future of health care and pharmacy practice, it is clear that pharmacists must play a more active role in assuring the safe, effective, and affordable use of medications for patients and populations. Likewise, they must possess the skills needed to function in interdisciplinary teams and lead teams toward continuous change and improvement of human health and health care. This will require much more than a curriculum rich in pharmacy-focused knowledge and skills. We must also train our students to think deeply and critically; to identify, understand, and address problems; to communicate clearly; and to work well in teams. They must be able to thrive in an evolving health care environment and to contribute meaningfully to improving patient care.

The work of the CTSC and subcommittees culminated in the inaugural Educational Renaissance Symposium on December 17-18, 2012; this marked the date when the school was planning to seek endorsement to move forward with the design of the new curriculum. The symposium convened faculty members, partners, and students and included keynote speakers from medicine, higher education, and engineering. Topics included health care reform, pharmacy practice innovations, accountabilities in higher education, and models of curricular reform. Notably, student leaders made a compelling case for change. The event resulted in 96% of attendees voting (anonymously) to participate in the design of a new curriculum. The symposium has been a highlight of the school's efforts to transform the curriculum, and it speaks to the commitment of faculty members, staff, and students to enriching student learning and advancing pharmacy education. In addition to the design of a new curriculum, several important initiatives have been implemented over the past 2 years. These initiatives have been instrumental in fostering a culture of change (Table 2) and in encouraging and rewarding excellence in teaching.

Executing a Transformative Curriculum

The CTSC was charged in January 2013 with facilitating the design of a transformative curriculum that would create graduates who are exemplary practitioners, leaders, innovators, and lifelong learners and would ensure that they are well positioned to have a positive impact on patient care and health care delivery. The defining elements and key features of the new curriculum are discussed below and are depicted in Figure 1.

Self-directed learning outside of class and active engagement of students in the classroom. The first year of the new curriculum will foster students' in-depth understanding of the foundations of pharmacy and of the pharmaceutical sciences. Nine courses serve as the foundation for student learning and will be taught using a “flipped classroom” approach—that is, factual content will be thoughtfully packaged and made available to students for self-directed learning outside of class, and class time will emphasize faculty-student interactions and higher forms of thinking and problem solving. The school has demonstrated early

TABLE 1.
Desired Outcomes, Defining Elements, and Guiding Principles of the New Curriculum of the UNC Eshelman School of Pharmacy

Desired outcomes^a

- Exemplary pharmacy practitioners who provide high-quality, team-based, patient-centered care.
- Leaders and innovators who recognize the health care needs of patients and society and who lead teams toward improvement and change for the betterment of patient care.
- Lifelong learners who continually strive for positive impact.

Defining elements

- Self-directed learning outside the classroom and active engagement of students in higher forms of thinking and problem solving inside the classroom.
- Fostering of scientific inquiry and innovation.
- Early immersion in direct patient care as a member of an interdisciplinary team.
- Reengineering of the admission process to emphasize both cognitive and noncognitive skills critical to student success in the new curriculum.

Guiding principles

- Faculty will instill in students habits of inquiry, curiosity, and critical thinking and inspire students to be lifelong learners and leaders in pharmacy.
- Ensure a rigorous and intensive curriculum that provides the necessary breadth to shape student development while providing students with a deeper understanding of medicines and the pharmaceutical sciences.
- Integrate active learning throughout the educational experience to build upon knowledge and skills and to develop higher forms of thinking and problem solving.
- Work collaboratively with other health professions to create opportunities to develop students as members of an interdisciplinary team.
- Implement an assessment plan to guide the development of student learning.
- Innovate, evaluate, and continually refine the curriculum ensuring a process of continuous quality improvement.

^aCore competencies have been identified to support achievement of the desired program outcomes.

TABLE 2.
Creating a Culture of Change at the UNC Eshelman School of Pharmacy

- Emphasis on the Educational Renaissance initiative in all faculty offer letters.
- Reinforcement of faculty effort and educational impact in the School of Pharmacy's appointment, promotion, and tenure guidelines.
- Valuing the scholarship of education and recruitment of tenure-track faculty members with primary scholarly interests in educational research.
- Solidification of the Partnership in Patient Care—a collaborative agreement between the UNC Eshelman School of Pharmacy, UNC Hospitals, and the UNC Department of Pharmacy—followed by the development of enhanced patient care partnerships with other key partners.
- Creation of The Academy, a community of faculty educators dedicated to enriching student learning and advancing pharmacy education.
- Creation of a core team of instructional designers, graphic artists, and programmers recruited to work closely with faculty members to create innovative and effective educational tools and products.
- Development of the Instructional Innovation Policy and Participation Agreement, a template agreement that engages and incentivizes faculty members to create highly innovative educational tools and methods.

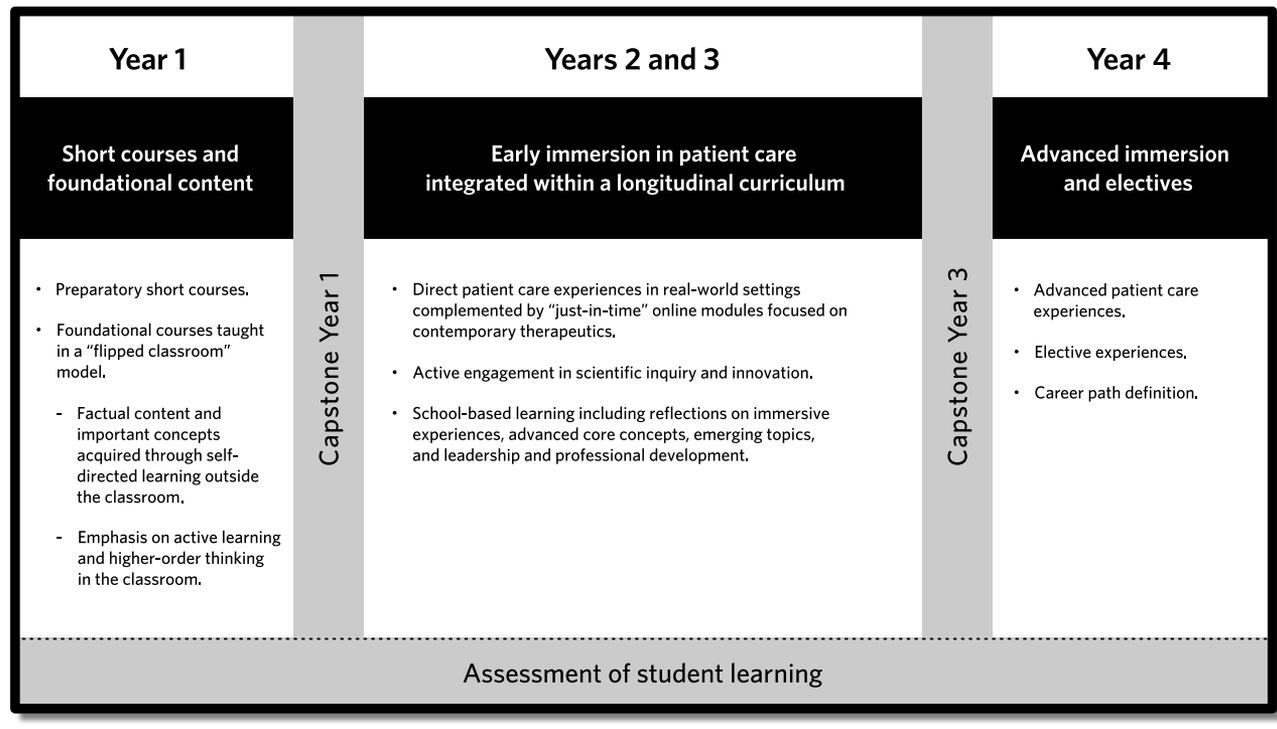
successes in using a team-based approach for teaching pharmacokinetics, which serves as a model for educating students in large classrooms [10]. Furthermore, the school's flipped classroom experience in pharmaceuticals has received widespread attention as a model for transforming student learning [11, 12].

Fostering scientific inquiry and innovation. In the spring semester of students' first year, they will take the first of an integrated series of courses and will participate in project-based experiences designed to foster inquiry and innovation. The goal is to instill in our students a mindset for solving problems and addressing health care needs through innovation, which will position them to be inquisitive professionals, change agents, and leaders. The project-based experience will focus on real-world problems and is grounded in the understanding that there is a common process for identifying and framing problems and developing innovative and effective solutions. Flexner proposed that, just as scientists must inquire, analyze, think critically, identify solutions, and continually refine their approach toward discovery, so too must medical practitioners, if they are to advance the practice of medicine and health care [2]. To cultivate these habits of mind, students must learn how to approach and solve complex problems through inquiry, critical thinking, and innovation rather than relying on memorization of facts [2, 3, 13].

In addition to offering these integrated courses, the school will design and pilot a longitudinal scholarship track, in which students will be mentored by faculty in their respective areas of research. We believe this track will be an ideal mechanism for fostering scientific inquiry and innovation; however, faculty members wish to pilot the program before implementing it on a broader scale, in order to gain more experience in terms of capacity, process, and outcomes.

Early immersion in direct patient care as members of an interdisciplinary team. Throughout their second and third

FIGURE 1.
Key Features of the Proposed New Curriculum of the UNC Eshelman School of Pharmacy



years, students will be immersed in direct patient care experiences (eg, primary care, community pharmacy, health systems, and internal medicine); these experiences will alternate with school-based learning. Students will be involved in caring for patients and will learn to function in complex systems as members of an interdisciplinary team. The faculty-facilitated, school-based learning component will occur in both large-classroom and small-group settings. This learning provides several opportunities for students: reflection following patient care experiences; integration and connection of learning; exposure to advanced concepts, emerging topics, and leadership development; and career path exploration.

An important component of the second and third years will be the use of online modules to deliver content focused on contemporary therapeutics. These modules will be developed by teams of clinical experts, with the goal of supplementing student learning in patient care settings. The modules can be viewed immediately prior to the start of a clinical rotation or "just in time" as new therapeutic areas present in the context of patient care.

Finally, the goal of the fourth year is to build upon early immersion experiences by providing students with the opportunity for advanced and/or specialized clinical rotations and built-in flexibility for defining their career paths.

Reengineering the admissions process. The school has a highly competitive admissions process. Approximately 80% of students admitted to the program have a prior bachelor's degree and an average admissions GPA greater than 3.5. Although academic performance is important, debate surrounds the reliance on academic indicators for assessing a student's postbaccalaureate potential [14]. In addition to academic performance, student motivation and soft skills (eg, empathy, collaboration, communication, adaptability) are essential for success; these skills are also directly related to the skill sets that are desired of the future workforce [4]. The school has invested time in understanding the role of cognitive and noncognitive characteristics in student selection and has worked to develop strategies to identify students with the potential to excel in our program. We have reached out to programs with recognized successes in transforming their admissions process [8, 15]. The new admissions process will place greater emphasis on identifying and assessing noncognitive skills that are critical to students' success in the new curriculum and will immerse prospective candidates in our academic culture.

Conclusion

Calls for reform in the delivery of health care and health professions education have been clearly stated. Reengineering a curriculum is not without its challenges, but the need for change, the desire to change, and a will to execute change are part of our culture. Society and our accrediting bodies are demanding that we better prepare students to continually improve health and health care and that health

professions work together to create meaningful experiences for students that foster team-based approaches to the delivery of patient care. Therefore, we have an unprecedented opportunity to make a positive impact on the next generation of health professionals and to shape the future of health care delivery. **NCMJ**

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