

VIEWPOINTS

Integration as a Paramount Educational Strategy in Academic Pharmacy

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Pharmacy education must continually adjust to the evolution of pharmacy practice, which is driven by sophisticated advancements in patient care, a rapidly growing body of biomedical information, and innovations in technology. Academic pharmacy should recognize the demands of the ever-changing pharmacy profession and respond to these challenges by development of innovative teaching strategies to ensure that pharmacy students develop the qualities, skills, and attributes required for provision of high-quality patient care. With the rapid advancement of technology, students are well-equipped to learn factual information on their own. But pharmacy educators should not leave it up to students to connect, combine, analyze, and integrate the overload of information they can freely access. Pharmacy curriculum should be adequately designed and delivered to prepare student pharmacists to adapt to new developments in the practice of pharmacy. One of the educational strategies that may help the academy train competent pharmacy professionals is *discipline integration*.

Basic and clinical disciplines are intertwined and interdependent. Integration breaks down the barriers between disciplines but, as a result, the contributions of each discipline are expanded and more appreciated. Horizontal integration links different subject areas such as pharmaceutical sciences, while vertical integration brings together basic and clinical sciences, and even more, service learning and experiential training. A learning process based on integration provides content with context and results in improved retention of knowledge. Information learned in isolation and disconnected from other experiences cannot be recalled and applied in a real-life situation.

Student pharmacists are the primary benefactors of curricular integration. Through integrated learning process, students learn how to deliver evidence-based health-care services and analyze and implement new research evidence and information; they are prepared to be creative, innovative, and competent. With integration as an educational strategy, the use of classroom time changes from low-efficiency lecture presentation to a highly effective active-learning format that engages students. In this innovative learning environment, students efficiently

use a large body of information, think critically, rationalize, synthesize factual information, and solve problems. Their primary focus shifts from grades and passing examinations to the relevance and applicability of the information they learn. Students can perform at a higher level of cognitive function because of contextualization of teaching. Clearly, integrated teaching and learning makes pharmacy students better intellectuals. Moreover, the process of integrated learning allows the students more interaction and deeper relationships with faculty members.

Use of the discipline integration strategy in the teaching of pharmacy professional programs brings about many valuable outcomes: it makes pharmacy education consistent with contemporary demands of pharmacy practice, health care, and society; brings clinical relevance to basic sciences and strengthen basic sciences in clinical training and pharmacy practice; enforces conceptual understanding and advanced reasoning; allows for evidence-based education; develops students' intellectual strengths; reshapes the delivery of curricular content; enforces the culture of collaboration across disciplines and team-work among faculty members and students; prepares students for interprofessional delivery of comprehensive and patient-centered health care services; advances development of the scholarship of teaching and learning; and promotes principles of life-long learning and continued professional development. All these outcomes are of paramount value to student pharmacists, pharmacy practice, and, ultimately, the patients who will be cared for by pharmacy professionals in an interdisciplinary health care model.

Many pharmacy programs have implemented discipline integration in response to accreditation standards recommended by the Accreditation Council for Pharmacy Education.¹ Research publications in this *Journal* show that pharmacy educators study integration of curricular content and experiment with various pedagogical formats that can help to implement integration to pharmacy teaching.²⁻⁶ Scholarly efforts should continue to find innovative ways to integrate curricular content and develop models that can be extrapolated to pharmacy programs as well as pharmacy experiential training sites. The educational strategy of discipline integration can provide

more effective curricular delivery, advance learning outcomes, strengthen and revive the pharmacy learning environment, and help the academy successfully address the critical issues facing pharmacy education.⁷ The integrated learning process should become the leading teaching strategy in academic pharmacy in the 21st century.

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