VIEWPOINTS

Curriculum Integration: A Self-Driven Continuum

Naser Z. Alsharif, PharmD, MS, PhD

School of Pharmacy and Health Professions, Creighton University

There is much interest in curriculum integration in pharmacy as evidenced by *Journal* articles on integrating learning exercises,[1] technologies,[2] skills laboratory activities,[3] courses,[4] and even the entire pharmacy curriculum,[5] as well as the publications of Viewpoints on the subject.[6] Brain research[7] and an era of accountability have driven this. Pearson and Hubbal[8] published a review of curricular integration in pharmacy and addressed barriers to integration including time and effort, the established culture, and lack of evidence on the effectiveness of integration. One aspect that was not addressed is the principled responsibility upon faculty members to ensure that the student experience is integrated. This means that faculty members bear responsibility to understand in depth what other faculty members are teaching, Accreditation Council for Pharmacy Education standards 10.2, 13.1 and 13.4.[9] Thus, integration first and most, has to be self-driven.

What does self-driven mean? Well, as faculty members in a professional program, we want students to see the big picture and to challenge them to make connections between the different disciplines they are learning. For example, science faculty members often stand in front of students and ask. "Do you remember this from anatomy? Biochemistry?" Clinical faculty members may state, "You should know this from pathophysiology or pharmacology!" This is somewhat hypocritical if we do not spend the time and effort to ascertain this so that we help facilitate their learning better. For many years in K-12, the idea of integration and for teachers to spend the time and effort to integrate concepts and disciplines have been more of the norm than the exception.[10] However, much of the success of these undertakings depend on the commitment of the teachers and their creativity to develop integrated lesson plans.[10] There is much for pharmacy educators to learn from the experience of K-12 teachers and we all should uphold an individual responsibility to carry ourselves up the ladder to become a more competent integrative educator.

Corresponding Author: Naser Z. Alsharif, PharmD, MS, PhD, School of Pharmacy and Health Professions, Creighton University, 2500 California Plaza, Omaha, NE 68178. Tel: 402-280-1857. Fax: 402-280-1883. E-mail: nalshari@creighton.edu

This continuum up the ladder should start with what we all do, identify courses and concepts which are prerequisites to our course. This should be taken seriously by pinpointing key concepts taught in our courses and tracking back to previous courses to determine the concepts needed to help the students master the content in our courses. The second step is to have purposeful communication with faculty members who are teaching in these prerequisite courses to ensure that these concepts are taught to the depth that we would expect them to be addressed and at the level at which the students should be evaluated. This will help with the third step in the continuum, to reinforce these prior concepts by revisiting them and integrating them with concepts in our courses, for example using technology[2] or devising integrated activities in skills laboratory,[3] teaching concepts across several disciplines (multidisciplinary),[8] developing thematic lesson plans based on different disciplines but a common theme (interdisciplinary),[8] and developing higher level assessments integrating these concepts. A must for science faculty in this whole process is to demonstrate the clinical relevance of their content and to tie it to future course work (eg, therapeutics).[9] A challenge for clinical and social/administrative faculty members is to make this process bidirectional and to emphasize science. The educational outcomes for the course should be a guide to help in this process including, for example, science faculty members revisiting core competencies from the social and administrative sciences to reinforce specific educational outcomes (eg, professionalism, communication skills). Hence, the emphasis is on supporting the whole curriculum. The highest level for any faculty member in this continuum is to invest the time and effort to conduct a scholarship of teaching and learning (SoTL)[11] study to evaluate if his/her methodologies or pedagogy are helping students see the big picture and integrate concepts. Collaborating with faculty members from other disciplines on these projects would help to truly meet Guideline 10.2[9] (awareness by faculty members of each other's courses including content, depth, methodologies used, and relationship to adopted curricular competencies and outcomes). Sharing findings of such studies with the curriculum, assessment committee, and the larger academic community is crucial

in this effort. Therefore, I strongly believe embracing this continuum will overcome the barriers identified above as it should be easier to overcome the time and effort and the established culture with a power of one rather than the whole faculty. Also, by conducting SoTL, evidence for the value of integration can be established. Consequently, this continuum commitment by each faculty member would be the impetus for making connections across the whole curriculum, ultimately making the learner more responsible for seeing the big picture.

REFERENCES

1. Kolluru S, Roesch DM, Akhtar LD. A multi-instructor, team-based, active-learning exercise to integrate basic and clinical sciences content. *Am J Pharm Educ*. 2012;76(2):33-33.
2. Alsharif NZ, Henriksen B. Electronic integration of prerequisite course content. *Am J Pharm Educ*. 2009;73(8): Article 44.
3. Harrold MW, McFalls MA. A pharmacy practice laboratory exercise to apply biochemistry concepts. *Am J Pharm Educ*. 2010; 74(8):Article 144.
4. Albano CB, Brown W. Integration of physical assessment within a pathophysiology course for pharmacy. *Am J Pharm Educ*. 2012; 76(1):Article 14.
5. Karimi R, Arendt CS, Cawley P, Buhler AV, Elbarbry F, Roberts SC. Learning bridge: curricular integration of didactic and experiential education. *Am J Pharm Educ*. 2010;74(3):Article 48.
6. Ratka A. Integration as a paramount educational strategy in academic pharmacy. *Am J Pharm Educ*. 2012;76(2):Article 19.
7. Caine R, Caine G. *Making Connections: Teaching and the Human Brain.* Alexandria, VA: Association for Supervision and Curriculum Development; 1991.
8. Pearson ML, Hubball HT. Curricular integration in pharmacy education. *Am J Pharm Educ*. 2012;76(10):Article 204.
9. Accreditation Council for Pharmacy Education. Accreditation standards and guidelines for the professional program in pharmacy leading to the doctor of pharmacy degree (Standards 10.2, 13.1 and 13.4). https://www.acpe-accredit.org/pdf/FinalS2007Guidelines2.0.pdf. Accessed August 12, 2013.
10. Etim JS, ed. *Curriculum Integration K-12: Theory and Practice*. Landham, MD: University Press of America, Inc; 2005.
11. Richlin L. Scholarly teaching and the scholarship of teaching. In: Kreber C, ed. *Scholarship Revisited: Perspectives on the Scholarship of Teaching and Learning*. San Francisco: Jossey-Bass. 2001: 57-58.