Educational Challenges Facing Basic Science Faculties

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**Keywords:** science, doctor of pharmacy, curriculum

Recently, I was provided an opportunity to contribute to a research project centered upon perceptions and assessment of consensus within 5 academic subdisciplines of pharmacy. One area that I found to be especially interesting was the differing perceptions among basic science faculty members and those in the areas of pharmacy practice and social and administrative science on the importance of general educational competencies (eg, communication, problem-solving and critical thinking skills). While those in pharmacy practice and social and administrative science ranked one or more of these general competencies among their top 4 teaching/educational issues, those in the basic sciences ranked them very low. This stark contrast emphasizes several educational issues that must be collectively addressed by those in basic science disciplines.

In a previously published “Viewpoint” article, Patrick Wooster discussed the need to maintain basic science content throughout the PharmD curriculum. I wish to follow along this path and offer the following educational challenges to my colleagues within the basic science disciplines. First of all, I suggest that a simple change in focus from content to the application of concepts may prove be a better pursuit. Basic science courses need to move away from the Joe Friday, “Just the facts, Ma’am,” mentality. Educating students on the principles, facts, and concepts of drug-receptor theory, mechanisms of action, structure-activity relationships, pharmaceutical formulations, and kinetic principles (to name just a few topic areas) is certainly a noble and important pursuit; however, those involved in basic science education need to assure that their students are also able to apply these principles to therapeutic decisions and offer in-depth explanations for their choices. If not already involved in such pursuits, faculty members within the basic sciences disciplines must begin to make a more concerted effort to assess the degree to which their students’ are able to analyze problems, think critically, and communicate their decisions. Developing examinations and other assessment tools that individually or sequentially cover the thought processes outlined by Bloom is one obvious solution.

Second, I firmly believe that all basic science faculty members need to incorporate some writing component within their courses. Faculty members in the areas of pharmacy practice and social and administrative sciences have already embraced this concept. As an example, pharmacy practice faculties expect students in their clinical rotations to review case studies and present their findings in both oral and written formats. Basic science faculties need to demand this as well. Accomplishing this task may be as simple as substituting or adding a few short answer/essay questions to the end of a standard multiple-choice examination, or as complex as creating a separate, integrated case study course to discuss the application of basic science concepts. I would like to take a moment here and share a few thoughts and experiences from my 17 years of teaching. While I have never been a big fan of multiple choice questions or examinations, I have learned to appreciate the complexity required to write challenging multiple-choice questions or examinations, I have learned to appreciate the complexity required to write challenging multiple-choice questions and their utility in assessing student comprehension. I typically incorporate a variety of question formats in my examinations; however, my favorite format is, and has always been, short answer explanation questions that follow fact-based questions. While it is good that a student can pick the proper compound or structural feature for a given scenario, it is even better when that student can explain why they chose the compound or structural feature. While grading short answer sections of examinations is certainly more time-intensive, I find my time to be well spent. Evaluation of students’ written explanations often identifies strengths and weakness in both my teaching and my students’ comprehension. This also affords an opportunity to counsel individual students or entire classes regarding common misconceptions and omissions.

Finally, I agree with Dr. Wooster that basic science content (or concepts) must be maintained throughout the curriculum; however, basic science faculties must also take the initiative to relate basic science concepts to
therapeutic decisions. It would be hypocritical to expect pharmacy practice faculties to continually relate therapeutic decisions to basic science concepts, unless basic science faculties initially take responsibility to hold students to a higher level, one in which they are able to analyze and apply basic science content (or concepts) to the provision of optimal patient care. Such efforts need to start early in the curriculum and increase in magnitude throughout all basic science courses. The implementation of integrated, disease-based courses at many schools has helped to meet this goal; however, further efforts based upon consensus and assessment must be established.

With apologies to the writers of Dragnet, I hope we can move from “Just the facts, Ma’am” to “Please analyze the situation and provide recommendations based upon foundational concepts from basic, clinical, social, and administrative sciences.” Not quite as memorable a quote, but a far superior goal for which to strive.

REFERENCES