

STATEMENTS

Preparing Graduate Students for Teaching and Service Roles in Pharmacy Education

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A formalized approach should be used by faculty mentors to prepare their protégés to assume teaching and traditional service roles in an academic position. Preparation in research has long been the focus of graduate education, neglecting other parts of the tripartite mission of academia, while neglecting teaching and service.¹ The Boyer Commission rebuked graduate education stating that it “. . .severely neglects the professional goal of the majority of students who will become college professors, that is to say, teaching.”² The Commission put forth several recommendations to rectify this deficiency in graduate education including: letting graduate students have time to adapt to graduate school before entering the classroom, treating graduate students as apprentice teachers, encouraging the use of technology in creative ways, and providing encouragement through special rewards for outstanding teaching. The Commission not only made teaching development recommendations but also indicated the need to address the service role^{1,3} The Commission also stated that graduate students are “. . .too often expected to know how to teach with little more than a few days or weeks of casual training and with little or no supervision throughout the year.”²

The responsibilities of teaching assistants vary across departments. Sometimes they are assigned teaching responsibilities with minimal preparation or they serve as minimally paid labor for the department, performing only menial tasks.^{1,3} Requiring a graduate student to teach without adequate preparation usually results in the graduate student repeating the mistakes of his/her previous instructors. On the other hand, working exclu-

sively as “cheap labor” minimizes the value of the learning experience. With proper mentorship, the teaching assistant is treated more as a budding colleague.

A report prepared by Golde and Dore for the Pew Charitable Trusts suggested the existence of a mismatch of purposes among doctoral education, graduate students, and the realities of academia. In higher education disciplines, graduate students pursue careers as faculty members, while the majority of graduate programs prepare them for careers in research.⁴ In order to address the needs and desires of both the students and college, concentration on addressing the rest of the tripartite mission, mainly that of teaching and service, should become paramount. Although many pharmaceutical science graduates pursue nonacademic research careers, the need for sufficient well-prepared faculty members in these disciplines must be considered.

A variety of service components can be formally incorporated in the graduate school experience. For example, service activities can be approached with an intense one-on-one mentorship between a faculty member and graduate student, and the use of a teaching assistantship can constitute a practical laboratory for teaching topics.

In our experience, a faculty mentor and graduate student can work as a team to instill the scholarship of teaching and learning and thereby prepare graduate students for a faculty/academic position. While supervised internships for graduate students have been discussed in the literature, they concentrated on teaching and were informal in nature. As Wankat cautioned, “. . .without a formal structure there is no way to certify what the graduate student has accomplished.”^{1,5} We believe a formal approach to a supervised internship can better prepare graduate students for faculty/academic positions. This method centers around the idea of a supervised internship having not only an advisor and graduate student sharing teaching activities but also participating in service activities. Purposeful preparation is as necessary for the success in teaching and service missions as it is for research.

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Proficiency in teaching and service roles will not be achieved if left to osmosis or simple modeling.

KOLB'S EXPERIENTIAL LEARNING CYCLE

Kolb developed the *Experiential Learning Cycle* to help conceptualize experiential learning as learning through discovery and experience in 4 different phases of a cycle.⁶ The *Experiential Learning Cycle*, as shown in Figure 1, composed of abstract conceptualization, active experimentation, concrete experiences, and reflective observation, provides the formal structure and theoretical basis for the supervised internship.⁶ Each component of the teaching or service activity is structured to complete the *Experiential Learning Cycle*. One can enter the cycle at any of the 4 points shown in Figure 1. It may not be possible to complete the learning cycle for every topic since many of the service activities can not be experienced while still in graduate school due to logistical and privacy reasons. The following demonstrates how a mentor and protégé could move through the *Experiential Learning Cycle*.

Abstract Conceptualization

Teaching. The process of abstract conceptualization involves the introduction of teaching and service topics along with the theory and conceptual basis underlying each.⁶ For teaching, this could involve a course in pharmacy education. The graduate education course could consist of a series of modules such as those listed in Table 1. Additional specific information can be found in the literature.⁷ It is possible to have a complete learning cycle for each module topic, an example of which is shown within Figure 1. In an institution where a specific course on pharmacy education is not possible, graduate students could take courses offered in other departments that address topics of pedagogy and effective teaching, or pursue independent studies. Alternatively, an online resource such as *Education Scholar* (www.EducationScholar.org), which covers many of the same topics that a graduate student and mentor could complete together, can be used.

Service. Service is the more difficult component to incorporate into the graduate school experience. For example, reviewing promotion and tenure documents is a skill that needs to be learned as it is riddled with issues

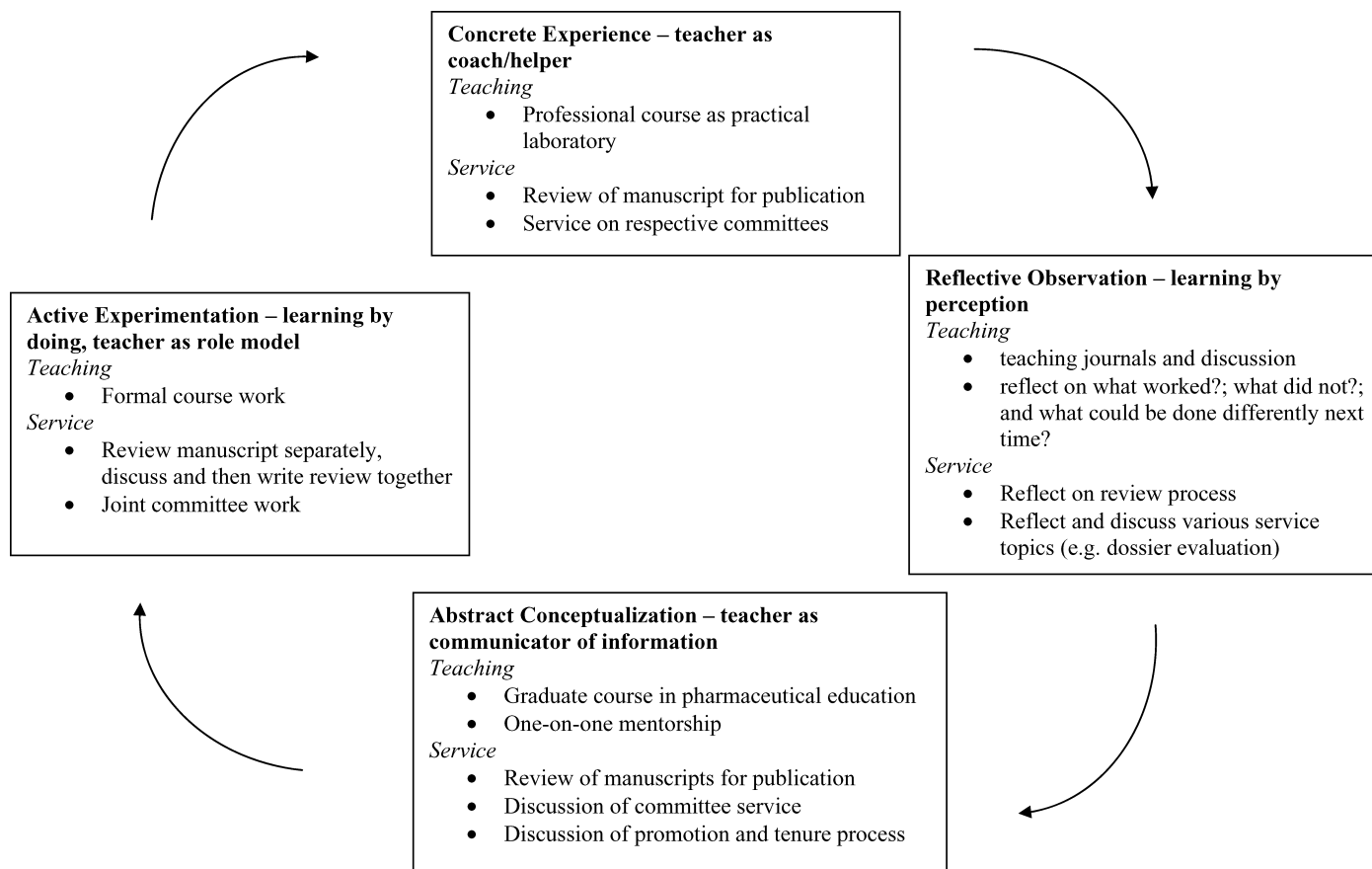


Figure 1. Teaching and Service Components in Kolb's Experiential Learning Cycle*
*Adapted from reference 6.

Table 1. Suggested Modules of a Graduate Course on Pharmacy Education

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- Evolution of pharmaceutical education
 - Commission to Implement Change in Pharmaceutical Education papers
 - Curriculum (organization, evaluation, outcomes, goals)
 - Pharmacy academia (tripartite mission, introduction to the American Association of Colleges of Pharmacy)
 - Learning theories, philosophies and taxonomies (eg, Bloom's, Gagné and Briggs)
 - Instructional Design – Course/Class preparation (including syllabus preparation)
 - Test construction principles (validity, reliability, strengths and weaknesses of different exam types)
 - Evolving your teaching to a scholarly level (Boyer's four forms of scholarship, teaching, and course portfolios)
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of confidentiality and an obligation to respect the privacy of the person whose future is being decided. Given privacy issues, some topics must be discussed with the mentor rather than experienced. Another activity that could only be vicariously experienced is that of running for state or national office for a pharmacy organization. Areas that need to be considered when deciding whether to accept a nomination for an office, as well as factors to consider in evaluating promotion and tenure dossiers, can be explored through in-depth conversations between student and mentor. These discussions would not complete the active experimentation or concrete experimentation phases of Kolb's cycle; however, reflective observation is possible by further discussing the topics and reflecting on them from different perspectives. It is possible to complete all the phases of Kolb's cycle with some of the service activities, most of which enter the cycle at the abstract conceptualization phase. Discussion concerning the importance of service on intramural committees as well as to state and national pharmacy organizations would provide socialization into the academic role.

Active Experimentation

Teaching. Active experimentation involves hands-on application of the topics and theories covered in the abstract conceptualization phase to solve problems and make decisions.⁶ An integral part of active experimentation is the teacher serving as a role model, so there would need to be a focus on joint activities that would maximize role-modeling opportunities. Course work in pharmacy education could form the basis of the active experimentation for the teaching component. For example, Bloom's taxonomy and the work of Gagné and Briggs could serve as frameworks for the construction of learning objectives and provide structure for an assignment and subsequent

practice in writing examination items and learning objectives. Mock class sessions and objectives could be presented to the rest of the class for discussion. An examination writing module could follow, building on the learning objectives module by covering examination writing theory and the advantages and disadvantages of the different types of examinations.

Service. Service experimentation can take the form of reviewing a journal manuscript, thus providing the opportunity for hands-on experience. The faculty mentor and graduate student review a paper separately (with authors names removed) to make the activity more realistic and to formulate individual unbiased appraisals. Discussion of the individual reviews can provide a great deal of material for further analysis of the process of reviewing manuscripts. A combined review would be jointly written, allowing the process for reviewing manuscripts to be explored from beginning to end. Service on department, college, and university committees should not only be allowed, but encouraged. Joint service by the mentor and protégé allows for a shared experience from each person's perspective. This can provide fodder for discussion about the way in which committees function within an academic setting.

Concrete Experiences Teaching. Kolb defines concrete experiences as ones in which individuals can "...involve themselves fully, openly, and without bias in new experiences"⁶ In concrete experiences, the teacher is thought to act as a mentor. For example, a course offered in the PharmD curriculum can serve as a concrete experience in the form of a practical laboratory to apply of the concepts and topics covered in the pharmacy education graduate course. The teaching assistant's activities and responsibilities should increase each year in keeping with the Boyer Commission's recommendation of allowing graduate students to adapt to graduate school before entering the classroom. Attendance and participation in training seminars should be allowed and encouraged. Part of the teaching assistantship training should address ongoing course improvement, materials development, and the analysis of the course's examinations for validity and reliability.

Service. Following the joint active experimentation of reviewing journal manuscripts, the graduate student should evolve to reviewing papers on his or her own. Service to the profession should also be stressed and encouraged. Opportunities could include continued participation in a professional service fraternity, involvement in Section Committees of the AACP, membership in pharmacy practice organizations, and participation in student chapters of organizations such as the American Association of Pharmaceutical Scientists (AAPS) and the

International Society for Pharmacoeconomics and Outcomes Research (ISPOR).

Reflective Observation

The process of reflective observation involves the mentor and mentee pondering various teaching and service activities both separately and together. This reflective observation centers around 3 questions upon which changes are made to engage in continuous quality improvement: (1) what worked? (2) what did not? and (3) what could be done differently next time? Independent and joint reflections increase and intensify learning.

Teaching. Individual teaching journals can be used to more formally document collective efforts in the classroom. The teaching journals provide a basis for postclass dialogue with the mentor and class session planning meetings. Both the mentor and protégé must be committed to continuous quality improvement in teaching. These discussions can lead both the mentor and mentee to enter the abstract conceptualization phase, this time both as students. For example, learning how to incorporate technology in the classroom could be the focus of a discussion. Many revisions of which can directly result from reflective observation.

Service. Reflecting through discussion of the different aspects of the peer review process could be used to complete the process of learning about manuscript review. Reflection through discussion is also used to further explore the components of service that can only be vicariously experienced, such as the review of promotion and tenure documents. Reflection on the strengths and weaknesses of the various committee structures and functions can fuel conversations on the keys to effective committee membership, management, and leadership.

These techniques can easily be transferred and implemented at other colleges and schools. The major prerequisite would be a faculty member who is actively involved in the scholarship of teaching and learning

since a necessary component of this methodology is the one-on-one mentorship and the associated role modeling. Currently offered or already established graduate courses on education could be examined for sufficient pedagogical training and emphasis on the scholarship of teaching and learning. Teaching assistantships could also be evaluated to ensure that opportunities to apply and implement the scholarship of teaching and learning are provided. Didactic course offerings could be investigated in other colleges on campus. The service component could be implemented by having the faculty member share his or her own service activities while also actively searching for opportunities for the graduate student to serve. To make the service more accessible to a wider group of graduate students, graduate student seminars could serve as a forum for discussion. This approach provides a framework for the deliberate preparation for the teaching and service roles.

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