

Description of an Elective PharmD Teaching Clerkship

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Students who graduate from colleges of pharmacy are well-educated and skilled in patient care and clinical activities, however most programs do little to prepare the graduate as a university teaching professor. Residencies and fellowships further hone the pharmacy graduate's skills in pharmacy practice and research. Although well-educated and skilled in patient care and clinical activities, most new faculty have had little or no formal education or experience in academic matters or in hands-on teaching. The purpose of this elective teaching clerkship was to provide PharmD candidates exposure to and opportunities for practicing those skills needed for effective teaching. The course goals were: (i) to familiarize the student with issues related to teaching at the university level; (ii) to understand techniques and underlying theories for various teaching methods; and (iii) to apply general teaching techniques and methods specifically to students in the health care educational setting. This clerkship provided the PharmD students with an option to receive a unique experience in developing the entry level skills required to be an effective teacher in a college of pharmacy.

INTRODUCTION

The Drake University College of Pharmacy and Health Sciences currently offers an entry-level BS in Pharmacy (0-5) and a track-in PharmD program. Students track into the PharmD program after their fourth year in the BS program and matriculate for two more years. Following one year of course work in the track-in PharmD program, students must complete 36 hours of experiential clerkships. Typically, clerkships in research and hospital pharmacy administration have been available to PharmD students as electives in addition to patient care clerkships. In the development of the clerkship format, it became clear that an experiential rotation giving a young graduate exposure to academic careers was missing. In the present curriculum, a two credit communication/teaching colloquium is offered in the first year of the track-in PharmD program. This course is defined as a multidisciplinary approach to refining communication skills with patients and health care professionals in the delivery of pharmaceutical care. It is largely a didactic course based on theories of communication and educational psychology. Students are introduced to the psychology of human learning as well as different teaching and learning styles. Goals are accomplished through assessment tools, class discussions, written reflection, videotaping and role playing. The teaching clerkship was designed largely as an extension of the two credit communication/teaching colloquium. The teaching clerkship provided the student with advanced experiential exposure to the academic environment.

Most graduates of PharmD programs accept positions in a pharmacy practice environment. Often times ASHP pharmacy practice residency programs are considered by students. Pharmacy practice residency programs generally provide emphasis in four areas: (i) acute patient care; (ii) ambulatory patient care; (iii) drug information; and (iv) practice management. A specialty practice residency may follow but its emphasis is usually focused in a clinical area (e.g., adult internal medicine, clinical pharmacokinetics, critical care, geriatrics, etc.). Fellowship programs are, by

definition, research oriented and often are focused in a specialized clinical area. While residencies and fellowships prepare young graduates for pharmacy practice positions, none of them places a large emphasis on preparing the graduate adequately as a university teaching professor. However, many of the practice positions are joint faculty positions at colleges of pharmacy where the role of the teacher is viewed as the most important component of the teaching-research-service triad. Excellence in teaching must be demonstrated for promotion and tenure. Even in large research intensive universities, excellence in teaching is viewed as an essential component. Additionally, young graduates who initially begin in clinical practice, may quickly migrate towards full time academic positions and many eventually end up as academic administrators(1).

Although well-educated and skilled in patient care and clinical activities, most new faculty have had little or no formal education or experience in academic matters or hands-on teaching. Most must experience a period of on-the-job training before being able to fully integrate themselves into the academic environment. As we see professional practice shifting towards the pharmaceutical care model, we will undoubtedly see a greater emphasis placed on hiring more quality clinical practice faculty. With AACP's recommendation that all schools/colleges of pharmacy adopt a six year entry level program leading to the PharmD degree, enhanced resources will be needed in clinical practice(2). Many curricular changes that are being made in PharmD programs involve the integration of clinical practice faculty with basic science faculty in course modules. Therefore, a continuing and likely increasing need for pharmacy practice faculty exists(3). Some colleges of pharmacy are developing academic clerkships as part of their entry level PharmD programs. These clerkships appear to have varying degrees of experiential portions. A clerkship developed by Keefer, *et al.*, put an emphasis on giving students an exposure to the academic setting by allowing any faculty member to accept an academic clerkship candidate. The

clerkship then had students involved in reviewing course objectives, being exposed to different instructional methods, preparing and delivering lecture material, and developing examination questions(4). Jackson, *et al.*, developed an academic/administrative rotation which involved reading much of the literature related to teaching, service and scholarly activity. In the rotation, the student became involved in many faculty projects, they interviewed other faculty members, attended faculty meetings and became involved in classroom teaching(5).

The purpose of this elective teaching clerkship was to provide PharmD candidates exposure to and opportunities for practicing those skills needed for effective teaching. The focus of the student during their professional program is related to acquiring the drug knowledge needed to practice within the pharmaceutical care model. However, the ability of the PharmD graduate to impart this drug knowledge on to the next generation of practitioners is also important. Therefore, the course goals were: (i) to familiarize the student with issues related to teaching at the university level; (ii) to understand techniques and underlying theories for various teaching methods; and (iii) to apply general teaching techniques and methods specifically to students in the health care educational setting.

COURSE DESCRIPTION

The clerkship was five credit hours and was scheduled for five weeks of contact time. The authors, one pharmacy administration and one clinical practice faculty member, co-directed the clerkship. Two students out of a PharmD class size of nine enrolled in the course. This course was divided into two components, a classroom discussion section and practical application. These two components overlapped after the first week as the students began their practical application. In the discussion portion, the students met formally with the instructors twice a week for a minimum of four hours total per week to discuss the assignments. The instructors were also available (and frequently used) for questions outside of required classroom time. The practical application component included having the clerkship students work with the undergraduate fourth-year BS pharmacy student (P-4) class in two separate courses also taught by the authors: one, a large lecture format course and one, involving smaller class sizes in a laboratory practicum.

Classroom Discussion

During class periods, students summarized and interpreted assigned book chapters and articles from the educational literature relating to general issues, strategies and teaching theory. Throughout the clerkship, students were expected to explain how educational theories had been applied to the pharmacy education literature and current courses taught in the college. In addition, the clerkship students were expected to assess the literature and current courses and recommend application improvements.

In addition to assigned readings, the students were required each week to select a short article from a given resource file containing innovative or controversial teaching techniques. These articles were then evaluated for theory and usefulness in a pharmacy curriculum. This file contained articles from *The Teaching Professor* (Magna Publications, Inc.), *College Teaching* (Heldref Publications) and similar works that the instructors had compiled over their academic careers. Because these articles contained ideas that did not

directly relate to pharmacy courses, the students were challenged to debate the merits of the techniques described in the articles and attempt to figure out ways in which these techniques could be used in the pharmacy classroom.

The classroom discussion section began on Week One with readings and discussions of course design, syllabus preparation and writing goals and objectives. The clerkship students used the given references on instructional objectives to evaluate several published course description objectives(6-8) and this course's stated objectives.(Appendix A) Two viewpoints were always looked at: (i) how the objectives 'fit' one model or another as written from an instructor's perspective, and (ii) how the objective could be interpreted or misinterpreted from a student's perspective. These two perspectives were always kept in mind when any weekly topic was being discussed. Week one also included a discussion based on Becker and Schafermeyer's *Educational Care 101: Prerequisite for Pharmaceutical Care*(9).

Week Two was spent in discussion of lecturing theory, styles and techniques. Incorporating problem-based and active learning during a lecture was stressed. During their PharmD courses, the clerkship students had become proficient in providing a one-time lecture/presentation but had little experience with actively involving the audience. Based on their own educational history, they also concurred with published findings that there is greater retention and understanding of material when the student is actively involved(10). Therefore, much of the classroom time during week two was spent helping the students decide upon which techniques would be employed during their required application portion of the course. Outlines for both the required paper and the series of required lectures along with learning objectives for the latter were also handed in at the end of this week.

During Week Three the students handed in their lecture notes draft along with specific discussion questions they planned on using for their lecture series. These were refined with the help of the instructors before moving on to learning about preparing and leading classroom discussions and case studies. Classroom work was followed immediately with application by having the PharmD students lead P-4 case discussions during this week.

Week Four was spent exploring evaluation methods for both instructors and students. This included testing, grading and teacher evaluations. The difficulties of subjective and objective grading methods were discussed as were the pros and cons of a variety of testing methods such as multiple choice and essay tests. The students were asked to individually write multiple choice test questions pertaining to the material they would cover in their lecture series. These test questions were then evaluated by both the instructors and students for content validity and proper qualifiers. The test questions were then used as part of the regularly scheduled exam given the following week in the P-4 class. The merits and pitfalls of teaching evaluations were also discussed during week four as the students awaited the results of their evaluations by the undergraduates.

The final week of classroom work was spent on a variety of topics including the critical thinking/problem solving process, motivating students, values and problem situations. Video vignettes taken from "Dealing with Problems" developed by the Center for Instructional Development at Syracuse University were used to stimulate discussion about problem students and dealing with them effectively as a faculty member. The clerkship students were given the

opportunity to ask questions relating to the faculty's roles aside from teaching. Issues of research, service, administrative duties, and the promotion/tenure process were also explored briefly. The clerkship students were also given the opportunity to review their teaching evaluations from the P-4 students on the last day of this course.

Practical Application

Students were expected to apply principles learned in the course to the classroom setting in the form of lecturing, small discussion groups, one-on-one patient counseling, and developing case studies. In addition, students wrote learning objectives and applied testing techniques.

Large Class Setting—Lecture. The classroom lecture application for the students consisted of responsibility for three hours of lecture in "Pharmaceutical Care" in the fourth-year undergraduate course in health care systems. Because of the nature of this pharmacy administration course, the students were expected to develop the material with an understanding of the theoretical base of pharmacy and hence there was a strong social and historical component. The clerkship students wrote objectives, developed an outline, wrote lecture notes, presented the classes, and wrote examination questions. They used some of the principles they had learned earlier in the discussion sessions of the course. These principles related to effective writing of learning objectives, available options in testing techniques and mechanisms to promote active learning in large class room situations. The clerkship students used the "buzz group" technique described by McKeachie as a method to promote active learner involvement(11). P-4 students in the class were split into groups based on odd-even rows and were asked to discuss such issues as the difference between clinical pharmacy and pharmaceutical care, barriers to providing effective pharmaceutical care and the difference between a pharmacist practicing as a co-therapist and a consultant. Four multiple choice test questions relating to the material on "Pharmaceutical Care" were written by the clerkship students as part of a 42 question examination.

Small Class Setting—Student Patient Counseling. A component of teaching can include subjective evaluation of students along with or in place of objective evaluations. To give the clerkship students an opportunity to practice one-on-one subjective grading, they were asked to grade the patient counseling techniques of the P-4 students in the professional practice course. The professional practice course uses a grading format (similar to the form developed by the APh A Academy of Students of Pharmacy/USP for judging the National Patient Counseling Competition) to provide feedback on student patient counseling. After extensive discussion and practice using this format, the clerkship students spent two days each week working with the P-4 students. Clerkship students were expected to role play a patient, effectively listen and give appropriate verbal feedback to the P-4 students. This feedback included giving positive reinforcement and suggestions for improvement to the P-4 students. The clerkship students were monitored during their interactions with the P-4 students at random times by both instructors to assess their subjective grading techniques. This also provided an opportunity for informal, problem solving development by the clerkship students when faced with a P-4 student who disagreed with their

assessment. The P-4 students were given an opportunity to evaluate the effectiveness of this teaching application.

Small Class Setting—Case Studies. A large component of the professional practice class was group discussion of mini-cases. In this part of the P-4 course, students were led through the problem solving process and were asked to actively participate in discussion of the cases. Examples of a mini-case include: "When a drug such as an NSAID is irritating to the stomach, explain your recommendations to the patient; include recommendations for the patient on a reducing diet or allergic to milk" and "How would you explain the use of an ophthalmic ointment to a 25 year old patient? What problems would a geriatric patient with arthritis and farsightedness have with an ophthalmic ointment?". The clerkship students were required to develop several mini-case problems and then to lead the discussion and analysis of these cases. Emphasis was placed on developing the clerkship student's ability to draw out non-responsive students, give positive feedback to participating students, and maintain control over the flow and content of the discussion. This process was repeated for eight class sessions. The students were again monitored by the instructors during these case discussions.

Discussion Paper

A short discussion paper was required from each student. The idea surrounding the paper was for the student to research and write on a contemporary issue in pharmacy education and to develop methods to implement a program within either a college curriculum, a specific course syllabus or as part of a practitioner training program. Students were asked to be visionary and were given wide latitude in the development of their paper. Students were asked to give special emphasis to the application of the idea in a real world setting and to discuss some of the problems they would likely encounter along the way. The following list included suggested topics for papers, however students could consider other topics that interested them, and with the consent of the instructors, were permitted to develop papers.

1. Develop an interdisciplinary lecture (3 hour) for fifth or sixth year students on a specific therapeutic classification (e.g., ACE inhibitors) and include the disciplines of: pharmaceuticals, pharmacology, pharmacokinetics, practice (e.g., "clinical"), and pharmacy administration.
2. Develop a simulated clinical clerkship experience model in a college of pharmacy "without external sites."
3. Develop a proposal to "credential" pharmacists in Iowa in "Pharmaceutical Care." A large piece of the proposal should relate to "how to educate" the pharmacists. Must consider development of standards.
4. Describe methods to make the student an "active learner" in a large class (e.g., >100 students).

STUDENT ASSESSMENT

Clerkship grades were assigned based on the successful completion of three components: (i) classroom discussion and presentations; (ii) discussion paper; and (iii) teaching application. Each component represented one-third of their grade. The students were first graded based on the participating faculty's assessment of how well the students were prepared for discussion and whether they could apply the educational theories to the assigned pharmacy literature and current curriculum. Students were evaluated indepen

Table I. Clerkship student teaching evaluation by 4th-year students (n=122)

Class setting	Evaluation measure	Percent agree or strongly agree
Large (lecture) ^a		
	Lecture objectives were clearly stated	80.2
	The material was presented in an organized manner	90.5
	Hand-outs contributed to learning	93.1
	Lectures were presented at a suitable level of understanding	94.8
	The "buzz group" technique was a useful teaching technique	38.8
Small (case study/ counseling) ^b		
	The clerkship students:	
	helped me think more clearly about the cases presented	84.4
	effectively lead the small group case discussions	85.3
	helped me to improve my patient counseling skills	85.3
	gave helpful feedback on my patient counseling	86.2
	graded my patient counseling fairly	76.2

^aClerkship student teaching evaluation by fourth-year (P-4) students in a large class setting (lecture).

^bClerkship student teaching evaluation by fourth-year(P-4) students in a small class setting (case study and patient counseling).

dently by each of the instructors on a scale that had the following definitions:

1. Discussion was salient, comprehensive and integrated material well. Presentation applied critical methods and was accurate and concise.
2. Discussion lacked some integration of material and presentation lacked some critical thinking.
3. Little integration or critical analysis was present. Information discussed or presented was not salient: information was not presented clearly.

The second component of their grade was based upon the required discussion paper's quality. The paper's creativity and usefulness in an actual course were areas that were stressed by the instructors. The same evaluation scheme as described above for the classroom discussions and presentations was used on the paper. The final component of the students grade was based upon the successful completion of the teaching applications.

The teaching application component of their evaluation was based on both instructor and student (P--4-) assessment. Teaching applications included the three hour lecture series on "Pharmaceutical Care" presented to the P-4 class, leading small group case discussions and evaluating student's patient counseling in the professional practice class. Since all pharmacy courses at the University are taught by faculty members, P-4 students were informed that the Teaching Clerkship was a new elective offering for PharmD students and that the clerkship instructors would be monitoring the classroom setting and evaluating the clerkship students closely. Objective measures used in grading these included a test item analysis provided by the Office of Academic Computing and teaching effectiveness evaluations that were completed by the P-4 students on a five point Likert-type scale for two different types of class room settings; one for the large class and one for the small class (Table I).

Clerkship students were generally given favorable P-4 students evaluations of the teaching application. In the large class setting, almost all the P-4 students thought the clerkship students presented the material in an organized manner and at a suitable level of understanding.(Table I). In addition, they thought handouts contributed to learning. Slightly over three-fourths thought the objectives were clearly stated reflecting the difficulty in writing clear objectives so that all students could understand them. It should be noted that the objectives that were written by the clerkship students were

critiqued by the instructors in this teaching application prior to their being handed out to the P-4 students. Less than one-half of the P-4 students agreed that the "buzz group" technique was useful. This may reflect the difficulty in making an active learning technique useful in the large class room setting.

The P-4 students generally rated the clerkship students in small class settings quite favorably (Table I). There was slightly more disagreement as to whether the clerkship students assigned patient counseling grades fairly with seventy-six percent choosing agree or strongly agree. Given the difficulty of assigning subjective grades fairly, the instructors felt the clerkship students did well. The clerkship students also felt that providing subjective assessments of students in a one-on-one situation was very difficult and they required much reinforcing or positive feedback from the instructor to master this application. Yet surprisingly, given the percent of P-4 students who thought they did well, the clerkship students felt that the hardest portion of this clerkship was trying to get unresponsive students to participate in a discussion.

The clerkship students' ability to write a good test question was assessed by test item analysis on the four questions they wrote as part of the 42 question examination in the Pharmacy Administration course. This analysis was provided by the Office of Academic Computing on campus. Question item difficulty for the four questions was consistent with the remainder of the examination test questions with 83.6 percent of the students (n=122) getting the questions correct. The discrimination index (a correlation) for each question, comparing the number of students answering the item correctly whose overall scores were in the upper and lower third of the class, was quite acceptable (0.25, 0.30, 0.20, 0.25). Generally, if the index is greater than 0 the item contributes to the discriminating quality of the test. Correlations that are low or negative mean that the wording of the question should be examined. Low or negative correlations also point out inconsistencies between lecture material and the information provided in the readings.

COURSE ASSESSMENT

The clerkship students were asked to evaluate the teaching clerkship after they had finished it. They felt that the clerkship met the stated objectives: increased their ability to teach, lecture, lead a group discussion and to assess students

both objectively and subjectively. Both students stated they would recommend the rotation to other PharmD students who were interested in an academic career. Recurring themes that were noticeable in the course evaluations were related to the value of "hands on" experience and their new found appreciation of how much work goes into preparing for small group discussions, lectures and case studies. The students found the short anecdotal articles from the *Teaching Professor* and *College Teaching* useful when lecturing and leading group discussions. In designing course objectives, they found many different ways an objective could be misinterpreted. The students also concluded that it was challenging to prepare teaching material for subjects that they considered themselves as being "less expert" than a preferred subject such as therapeutics.

Clerkship student recommendations for improving the course included having students write several small (one to two page) discussion papers rather than one longer paper. Additionally, the students thought it would be useful if they were video taped during their lectures, discussions periods and case studies. These changes will be considered for next year's clerkship.

A course involving the experience of only two students is difficult to assess. Based on the initial evaluation and student interest, the clerkship will be offered again in the future. Data will be collected regarding both student and course evaluations and will include more information on self-assessment and outcome measurement. Even though the clerkship is time consuming for faculty members, it affords an excellent opportunity for the faculty members to serve as role models and mentors for students. This clerkship allows students to work closely with faculty members and allows the students to experience some of the challenges, frustrations, and rewards of teaching and to share them with their faculty mentors.

CONCLUSION

The teaching clerkship provided the PharmD students with an option to receive a unique, advanced experiential clerkship in teaching. This clerkship gave the students an opportunity to apply principles and theories from the educational literature to the classroom setting where various teaching/learning formats were used.

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- (5) Jackson, R.A., "An academic/administrative rotation," (abstract), *ibid.*, **58**, 121S(1994).
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- (8) Nelson, A.A. and Maddox, R.R., "An assessment of the mastery of entry-level practice competencies using a primary care clerkship training model," *Am. J. Pharm. Educ.*, **56**, 354-363(1992).
- (9) Becker, E.S., and Schafermeyer, K.W., "Educational care 101: Prerequisite for pharmaceutical care," *J. Pharm. Teaching*, **2**, 29-41(1993).
- (10) McKeachie, W.J., *Teaching Tips*, 9th ed., Health & Co, Lexington MA (1994) pp. 282-284.
- (11) *Ibid.*, pp.44-45.

APPENDIX A. TEACHING CLERKSHIP OBJECTIVES

At the end of this rotation the student should be able to:

- write objectives for a course, a lecture, and an assignment using Mager's three characteristics for clear objectives: performance, conditions, criterion;
- evaluate and rewrite if necessary selected objectives using Mager's criteria;
- list in a logical sequence the steps necessary for developing a case study;
- list steps necessary for problem solving;
- assess student patient counseling for accuracy; effective, clear use of words; completeness of information given; nonverbal body language, using the USP National Patient Counseling Competition guidelines;
- make a checklist of the important points that should be covered when counseling a patient about the following medications: oral anti-diabetic agents; anti-hypertensives; pain modulators; theophylline; lipid therapy; anti-anxiety/depression drugs; antibiotics;
- use this checklist to facilitate assigning grades (for completeness of information) to P-4's patient counseling;
- design a "teacher evaluation" to be used by the P-4 students in the pharmacy administration and professional practice classes to assess your effectiveness in the classroom;
- given a resource file, select one or two examples ("Teaching Tips"/articles) and be able to discuss for approximately five minutes the merits and relation to teaching theory;
- lead a small class discussion on a given topic, prevent excessive deviation from the topic, and be able to have the class summarize conclusions;
- write a short (10 page) discussion paper on a given topic including objectives, syllabus, methods of instruction and evaluation when appropriate;
- describe methods that can be useful for handling "difficult students";
- given a description of an undergraduate course and a classroom scenario, select the type of classroom testing (objective, essay, oral, etc.) that would be most appropriate and justify the answer;
- list advantages and disadvantages of the following objective evaluation techniques: short answer, true-false, multiple choice, matching, written, oral, etc.;
- given a 3 hour time block of instruction for a selected topic, prepare learning objectives, lecture notes, class outline and test questions; Present the class.

APPENDIX B. WEEKLY READING SYLLABUS

Week 1: Course Design, Syllabus, Goals and Objectives.

- McKeachie, W.J., *Teaching Tips*, 9th ed., Health & Co, Lexington MA (1994) pp. 9-20.
- Mager, R.F., *Preparing Instructional Objectives*, revised 2nd ed., Lake Publishing Company, Belmont CA (1984).
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Week 2: Lecturing

- McKeachie, W.J., *Teaching Tips*, 9th ed., Health & Co, Lexington MA (1994) pp. 53-70, 97-210, 211 -221.
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Week 3: Discussion/Case Study

- McKeachie, W.J., *Teaching Tips*, 9th ed., Health & Co, Lexington MA (1994) pp. 31-52, 9-161.
- Sims, P.J., "Utilizing the peer group method with case studies to teach pharmaceuticals," *Am. J. Pharm. Educ.*, **58**, 78-81(1994).
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Week 4: Evaluation: Testing and Grading, Evaluation of Teaching

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Week 5: Critical Thinking/Problem Solving, Motivation, Values, Problem Situations

- McKeachie, W.J., *Teaching Tips*, 9th ed., Health & Co, Lexington MA (1994) pp. 251-261, 349-358, 359-367, 369-372, 373-384.
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