Integration of Pharmacotherapy Poster Presentations into the Advanced Practice Experience

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ABSTRACT. This article describes the incorporation of poster presentations into the pharmacy curriculum at the Harrison School of Pharmacy. A poster presentation assignment was incorporated into the Advanced Practice Experiences (APE) as a way to have students identify therapeutic issues relevant to pharmacy practice, evaluate biomedical literature, and professionally communicate information in a written and oral format. Student performance indicators included observation-based assessment with mean scores for years 1-3 of 92%, 93%, and 93%, respectively.

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Faculty rated students highest with regard to dimensions of professionalism (94-100%) and lowest with respect to biomedical literature analysis (83-93%). Student and faculty perceptions regarding the achievement of specific ability-based outcomes were measured through surveys. Overall, 80% of students during the 3 years agreed that poster presentations were useful to their future professional careers. Modifications focusing on the grading process, communication, organization, and professionalism have been made based on annual assessment data. Findings indicate that a poster presentation is an effective way to promote communication, social interaction, self-learning, critical thinking, and professionalism within Advanced Practice Experiences.

KEYWORDS. Poster presentation, communication skills, writing skills

INTRODUCTION

Pharmacy education is increasingly focused on student achievement of performance outcomes that lead to self-directed, lifelong learners. The educational paradigm has shifted to recognize learning as an active, dynamic process in which connections are constantly made when students critically analyze, discuss, and use information in meaningful ways. As a result, educators are challenged with the task of developing creative learning assignments that address issues such as critical thinking, communication, and lifelong learning.

Poster presentations are an effective and efficient educational communication tool (1, 2). They promote activities encouraging students to explore alternative means of defining content. Posters facilitate the sharing of information in a creative, interactive, and professional manner. Educators promote poster presentations as a way to "escape the confines of lecture and the constraints of having to listen to the obvious, repetitious, uninteresting, and irrelevant" (2). Posters promote independent and critical thought, allow speakers to create unique, self-paced works, and necessitate the application of learned materials (2, 3).

Because poster presentations are an effective method of promoting learning, this educational technique was incorporated into an existing course taught concurrently within the ten-month sequence of HSOP Advanced Practice Experiences as a means to promote ability-based

outcomes in an imaginative manner and to expose students to an additional form of professional communication. To ensure quality, the course was designed to incorporate Chickering and Gamson's "Seven Principles for Practice in Undergraduate Education" (4). As a method of encouraging civic engagement, students were asked to develop project ideas and presentations around professional activities that might have direct impact on patients seen during the practice experiences.

GOALS

The poster assignment was designed to promote the ability-based outcomes outlined in Table 1. The assignment is intended to develop a student's ability to evaluate and synthesize pertinent literature, to analyze data, and to effectively communicate information in a professional manner. In addition, the course aims to encourage students to be self-directed, critically reflective, and competent in skills essential to providing optimal patient care and maintaining an effective pharmacy practice.

Presenting a poster may seem like an insurmountable task to a practitioner who has not been exposed to or practiced this method of professional communication as either a pharmacy student or resident. By having students gradually walk through the steps of a poster presentation with the guidance of a faculty advisor, they are often less intimidated by the process and more apt to contribute to the body of professional literature.

COURSE DESCRIPTION

Clinical Seminar (PYPP 5680) is a required, two-hour course offered simultaneously during the fourth professional year of pharmacy school as students complete ten months of advanced practice experiences. During this time, pharmacy students are assigned to one of four regional sites across Alabama for the duration of experiential training.

Before 1998, the course was composed of post-B.S. or track-in Doctor of Pharmacy (Pharm.D.) students with class sizes averaging approximately ten students. The course did not include a poster presentation at that time, but rather two platform presentations in which students identified and researched pharmacotherapy topics and subsequently presented findings. These formal presentations were delivered with aid of audiovisual equipment. One presentation was given at a regional site and one at

TABLE 1. Ability-Based Outcomes for PYPP 5680.

Programmatic Outcome Abilities	Course Objectives
Communication Abilities	Students will effectively articulate and defend a pharmacotherapy issue using an organized, logical, and concise method and effective verbal, written, and listening abilities.
Thinking Abilities	Students will analyze drug information needs and appropriately apply biomedical literature to critically evaluate a pharmacotherapy issue.
Professional Ethics and Identity	Students will exhibit ethical and professional behavior during all aspects of the course.
Social Interaction, Citizen-ship, and Leadership	Students will display accountability, respect, and appropriate time management and interpersonal abilities.
Self-Learning Abilities	Students will demonstrate a self-motivated character when responding to recognized self-limitations and/or project needs.

the main campus. Emphasis was placed on literature evaluation, statistical analysis, and communication abilities. In preparation for the implementation of the entry-level Pharm.D. degree program, it was apparent at our institution that this format would not accommodate an increase in class size in which 85-100 students would present 30-45 minute presentations twice during the course. Therefore, the course was modified to eliminate one platform presentation and replace it with one scholarly project presented via a poster presentation format. The course faculty believed this change would allow students to gain experience with two methods of professional communication and decrease the amount of time required for faculty to observe and grade formal presentations.

The poster assignment, project materials, and evaluation forms were developed and sent to four reviewers from various schools of pharmacy across the nation to determine content validity. The course was modified based on reviewer responses. The revised course was instituted in 1998 as HSOP transitioned to the entry-level program, although the first two classes to participate in the poster assignment were track-in Pharm.D. classes. Each of these two track-in classes contained 30-40 students; however, in year three the class size increased to 85 students as the first entry-level Pharm.D. students participated in the course.

The course coordinators worked closely with individuals at each regional site to provide assistance and quality assurance between regions. Each student was assigned a faculty advisor in his or her region who was responsible for mentoring the student and assessing individual performance. When the class size increased in year three, the class was randomly divided into two sections. One group was assigned to give poster presentations at the Fall 2000 HSOP Poster Forum, and the second group was assigned to present posters at the Spring 2001 HSOP Poster Forum. This decision was based on the availability of space and poster materials.

THE POSTER ASSIGNMENT

The poster assignment was a multipart individual assignment in which students were required to identify a therapeutic issue or controversy, evaluate relevant literature, design methods to collect and analyze relevant data, write a technical paper summarizing the evaluation and importance to pharmacy practice, and present the information at the HSOP Poster Forum. The course syllabus was modified (50% of the grade was determined by poster assignment) to incorporate the poster

assignment, and a poster manual was distributed to all students. This manual provided information regarding the purpose of posters, project timeline and activities, advisor assignments and contact information, examples of poster layouts, and additional resources for creating effective posters and writing quality papers.

To maximize student success, advisors guided students through the poster development process. Topic requirements were vague to promote creativity; however, topic approval by the assigned advisor was required. Students worked on the project simultaneously as they completed their advanced practice experiences. Advisors were available to help students gather pertinent literature and to discuss appropriate search strategies, data analysis, and literature evaluation. The typical interaction between advisor and student varied but involved discussions such as improving search strategies, identifying appropriate literature, interpreting the literature, developing data collection instruments, written drafts, and designing the poster layout. Students were given the following timetable for project completion: (1) project proposal due at least three months prior to the presentation, (2) written paper due at least one month prior to poster presentation, and (3) a preliminary poster layout reviewed with advisors at least two weeks prior to the presentation.

Frequent communication with advisors was encouraged, but it was the student's responsibility to approach advisors for assistance. Written drafts were encouraged prior to submission of the final paper. The paper included an abstract, introduction, objectives, methods/procedures, results, conclusions, and a statement of importance to current or future pharmacy practice. The format of the paper followed the Uniform Requirements for Manuscripts Submitted to Biomedical Journals; however, students were not required to submit the papers for publication.

All students were required to present their finished work during a two-hour poster presentation at HSOP. The forum was designed to mimic the format of poster presentations at national pharmacy meetings. All first-, second-, and third-year HSOP pharmacy students were required to attend the forum as part of a professional seminar series and other health care practitioners were invited to attend.

ASSESSMENT

To assess the effectiveness of this assignment as a learning method, both student performance and student perceptions were evaluated regarding the quality of the learning experience and whether it promoted

the development of the ability-based outcomes. Student performance was measured by course grades. The course grade was based on the poster (50%) and the platform (50%) presentations. For the purpose of this paper, we will focus on the assessment techniques used with regard to the poster assignment. The Overall Poster Project Evaluation (OPPE) form was developed to assist with grading of the poster presentation (see Appendix A). The faculty advisor used this instrument to evaluate student performance longitudinally through the poster development phase and at project completion by grading the written paper and poster presentation. The instrument specifically guided advisors to evaluate three domains: appropriate evaluation of biomedical literature, effective communication, and professionalism. Student and faculty perceptions were assessed by survey results (see Table 4) and focus group discussions in which objective and subjective data were collected.

RESULTS

Between August 1998 and May 2001, 155 pharmacy students participated in the poster presentation assignment. The poster presentations were held May 1999 (designated Year 1, $n = 30$), March 2000 (designated Year 2, $n = 40$), and November 2000/May 2001 (designated Year 3, $n = 85$). Table 2 provides a sample of presentation topics chosen by students during the study period.

Student Performance

The OPPE form assessed student performance (see Appendix A). The rater scored student performance on a scale of 1 to 4 as described within the grading instrument. Points awarded for each section were combined and divided by the total number of sections. The raw score (e.g., 2.9) was converted to a grade (e.g., 84%) by using a conversion table found in the instrument to determine the overall performance score for the assignment. The mean (SD) performance scores of all students were 92% (2.9), 93% (4.2), and 93% (3.6) for Years 1-3, respectively. Average scores for each of the main evaluative sections of the OPPE form are presented in Table 3. Student scores were highest in the dimensions evaluating professionalism (94-100%). The lowest scores were achieved in the areas pertaining to biomedical literature analysis (83-93%).

TABLE 2. Sample of Poster Presentation Topics.

- "The Letter in the Litter: A Public Information Pamphlet to Reduce the Incidence of *Toxoplasma gondii* in Pregnant Women and Their Children"
- "A Pharmacoeconomic Analysis of the Treatment of UTIs in an Ambulatory Care Clinic"
- "Are Nursing Home Residents Over- or Undermedicated?"
- "MRSA-Associated Pneumonia: A Cost-Effectiveness Analysis of Vancomycin and Linezolid"
- "Trial of a Student-Driven Asthma Education Program Within a Community Pharmacy"
- "Empiric Use of Vancomycin for the Treatment of Febrile Neutropenia"
- "Developing a Protocol for the Management of Catheter Occlusions"
- "A Comparison of the Management of Hypertension in a Rural Versus Urban Setting"

TABLE 3. Overall Poster Presentation Evaluation (OPPE) Analysis 1998-2001.

Components of Assessment	Maximum Points	Year 1 Score (%)* (*N* = 30)	Year 2 Score (%)* (*N* = 40)	Year 3 Score (%)* (*N* = 85)
Evaluation of Biomedical Literature				
• Comprehensive search strategy	28	24 (86%)	26 (93%)	25 (89%)
• Summary and evaluation of literature	24	21 (88%)	21 (88%)	22 (92%)
• Conclusions from literature	12	10 (83%)	11 (92%)	11 (92%)
Effective Communication				
• Writes a clear and concise paper	28	25 (89%)	26 (93%)	25 (89%)
• Presents an informative poster	52	48 (92%)	49 (94%)	50 (96%)
Professionalism				
• Self-direction	20	19 (95%)	19 (95%)	19 (95%)
• Social interaction, citizenship, leadership	16	16 (100%)	16 (100%)	15 (94%)

*Represents average raw score (average percentage score); refer to Appendix A to review the specific items used to evaluate student performance as it pertains to the categories above.

Student Perceptions

Student perception surveys contained 20 questions that were completed by all pharmacy students (Table 4). Survey questions 2, 5, 9-10, and 14-20 evaluated whether students believed specific ability-based outcomes were achieved. Communication abilities were addressed in questions 5 and 9. The respondents who agreed or strongly agreed that these outcomes were achieved ranged from 81-87%. Critical thinking

TABLE 4. Student Perception Surveys 1998-2001.

Questions	Period	*SD	D	N	A	SA
1. This program was useful to my professional career.	**Cumulative**	**0%**	**6%**	**14%**	**61%**	**19%**
	Year 3 (2000-01)	0%	5%	10%	71%	14%
	Year 2 (1999-00)	0%	6%	15%	58%	21%
	Year 1 (1998-99)	0%	7%	17%	53%	23%
2. I was challenged to use my critical thinking/communication skills. [Thinking Abilities]	**Cumulative**	**0%**	**0%**	**7%**	**62%**	**31%**
	Year 3	0%	0%	11%	58%	31%
	Year 2	0%	0%	3%	61%	36%
	Year 1	0%	0%	6%	67%	27%
3. Student/faculty interaction was a valuable learning experience.	**Cumulative**	**0%**	**6%**	**16%**	**44%**	**34%**
	Year 3	0%	0%	4%	56%	40%
	Year 2	0%	9%	24%	36%	31%
	Year 1	0%	10%	20%	40%	30%
4. I received sufficient faculty guidance to assist me with this project.	**Cumulative**	**0%**	**8%**	**8%**	**33%**	**51%**
	Year 3	0%	0%	3%	36%	61%
	Year 2	0%	12%	8%	39%	41%
	Year 1	0%	13%	13%	24%	50%
5. I feel this will be useful to me when presenting future posters. [Communication Abilities]	**Cumulative**	**0%**	**2%**	**11%**	**33%**	**54%**
	Year 3	0%	0%	8%	29%	63%
	Year 2	0%	3%	15%	36%	46%
	Year 1	0%	3%	10%	33%	54%
6. I prefer alternative teaching methods like this over standard lectures.	**Cumulative**	**2%**	**13%**	**25%**	**35%**	**25%**
	Year 3	0%	3%	10%	63%	24%
	Year 2	3%	24%	24%	18%	31%
	Year 1	3%	13%	40%	24%	20%
7. The information/guidance adequately prepared me for the project.	Cumulative	**4%**	**7%**	**16%**	**38%**	**35%**
	Year 3	0%	0%	8%	41%	51%
	Year 2	6%	3%	24%	46%	21%
	Year 1	6%	17%	17%	27%	33%

TABLE 4 (continued)

Questions	Period	*SD	D	N	A	SA
8. This project was a valuable learning experience.	**Cumulative**	**0%**	**3%**	**16%**	**43%**	**38%**
	Year 3	0%	0%	9%	33%	58%
	Year 2	0%	6%	18%	42%	34%
	Year 1	0%	3%	20%	53%	24%
9. I feel more competent and confident with my presentation skills. [Communication Abilities]	**Cumulative**	**0%**	**3%**	**16%**	**48%**	**33%**
	Year 3	0%	0%	0%	53%	47%
	Year 2	0%	0%	18%	61%	21%
	Year 1	0%	10%	30%	27%	33%
10. I feel more competent in my literature search and retrieval skills. [Thinking Abilities]	**Cumulative**	**1%**	**2%**	**12%**	**48%**	**37%**
	Year 3	0%	0%	4%	47%	49%
	Year 2	3%	3%	12%	55%	27%
	Year 1	3%	3%	20%	43%	31%
11. I feel faculty involvement should have been greater.	**Cumulative**	**28%**	**37%**	**18%**	**8%**	**9%**
	Year 3	48%	47%	5%	0%	0%
	Year 2	13%	36%	27%	12%	12%
	Year 1	24%	27%	23%	13%	13%
12. Evaluation forms provided helpful feedback.	**Cumulative**	**1%**	**9%**	**34%**	**44%**	**12%**
	Year 3	0%	0%	17%	64%	19%
	Year 2	0%	9%	39%	46%	6%
	Year 1	3%	17%	47%	23%	10%
13. Overall, my experience with this project was excellent.	**Cumulative**	**0%**	**6%**	**22%**	**55%**	**17%**
	Year 3	0%	0%	8%	69%	23%
	Year 2	0%	9%	15%	58%	18%
	Year 1	0%	10%	43%	37%	10%
14. This project helped me to develop my professional value system and demonstrate an evolving professional identity. [Professional Ethics and Identity Abilities]	**Cumulative**	**1%**	**9%**	**21%**	**52%**	**17%**
	Year 3	0%	6%	15%	64%	15%
	Year 2	0%	9%	24%	46%	21%
	Year 1	3%	13%	23%	47%	14%
15. Project promoted independent thought and application of materials. [Self-Learning Abilities]	**Cumulative**	**0%**	**3%**	**6%**	**62%**	**29%**
	Year 3	0%	0%	3%	72%	25%
	Year 2	0%	3%	6%	61%	30%
	Year 1	0%	3%	10%	52%	33%

16. This project promoted pharmacy professionalism. [Social Interaction, Citizenship, Leadership Abilities]	**Cumulative**	**1%**	**3%**	**9%**	**47%**	**40%**
	Year 3	0%	0%	3%	56%	41%
	Year 2	3%	3%	6%	49%	39%
	Year 1	0%	7%	19%	37%	37%
17. Project helped me to develop effective interpersonal skills. [Social Interaction, Citizenship, Leadership Abilities]	**Cumulative**	**2%**	**3%**	**17%**	**51%**	**27%**
	Year 3	0%	0%	0%	63%	37%
	Year 2	3%	6%	15%	49%	27%
	Year 1	3%	3%	37%	40%	17%
18. This project successfully met all course objectives.	**Cumulative**	**0%**	**4%**	**22%**	**55%**	**19%**
	Year 3	0%	3%	8%	60%	29%
	Year 2	0%	3%	21%	55%	21%
	Year 1	0%	7%	36%	50%	7%
19. I have a better understanding of factors that motivate pharmacists to make pharmacotherapeutic decisions. [Professional Ethics and Identity Abilities]	**Cumulative**	**1%**	**6%**	**17%**	**47%**	**29%**
	Year 3	0%	0%	6%	54%	40%
	Year 2	0%	9%	12%	55%	24%
	Year 1	3%	10%	33%	33%	21%
20. This project promoted self-learning abilities. [Self-Learning Abilities]	**Cumulative**	**0%**	**0%**	**6%**	**47%**	**47%**
	Year 3	0%	0%	3%	50%	49%
	Year 2	0%	0%	3%	45%	52%
	Year 1	0%	0%	13%	47%	40%

*SD = strongly disagree, D = disagree, N = neutral, A = agree, SA = strongly agree

and self-directed learning were addressed in questions 2, 10, 15, and 20. Students who agreed or strongly agreed that these outcomes were achieved ranged from 85-94%. Professionalism and social interaction were evaluated in questions 14, 16, 17, and 19. Students who agreed or strongly agreed with the achievement of these outcomes ranged from 79-87%. Overall, 80% of the students believed the program was useful to their future professional career, and 72% agreed their experience with this project was excellent. These scores rose to 85% and 92%, respectively, when only the Year 3 data were evaluated.

Following each poster presentation, information was gathered from participating faculty members to make modifications in the course. A sample of faculty feedback is shown in Table 5. Overall, the feedback was positive and constructive.

DISCUSSION

Contributing to the body of professional knowledge is an important responsibility of future health care professionals; however, training or encouragement in oral and written communication may be underemphasized in pharmacy education. As students evolve into practicing pharmacists, they will undoubtedly encounter challenges and therapeutic controversies. Sharing their strategies for resolving these issues is a necessary component of enhancing patient outcomes and an obligation to the profession.

TABLE 5. Faculty Comments About Poster Presentations.

- "Conceptually an excellent idea and it worked well overall. I particularly applaud the inclusion of a technical paper because we need to do more to help students develop their generally weak writing skills."
- "Make sure students have poster manual and all supporting documents before leaving the campus to begin the clerkship year."
- "The students were generally thrilled that they did a project to make a difference in patient care."
- "This is a well-organized program that directs the students toward the expected outcomes. The poster format, an informal manner for presenting scientific information, leads students to develop a meaningful manuscript and present it. The program is designed in a way that develops all vital skills so necessary to the modern pharmacist."
- "Evaluation and survey forms are well designed, concise, and complete. They cover the skills developed during the preparation and presentation of the poster as well as lead the preceptor to the correct perception of students' performances and learning styles."

Pharmacy educators share a responsibility to prepare students to be able to convey new clinical knowledge, unique practice initiatives, or innovative teaching strategies with the rest of the profession through article publication and poster presentations. Writing compels students to really think through a topic, analyze the information, and synthesize this information into an organized, cohesive document. Writing can be an essential tool not only in helping students convey their ideas but in helping them formulate them, as well (5). Poster presentations have become one of the most common methods of communicating innovative ideas in an efficient, professional manner. As a result, nearly all pharmacy organizations incorporate poster presentations into regional and national meetings. Through participation in the HSOP Poster Forum, students gain confidence and basic knowledge and skills needed to participate in state and national poster symposiums while enhancing their ability to write effectively. Participating in a professional poster forum exposes students to additional forms of professional communication, reinforces the professional socialization process, and allows them to contribute to the advancement of pharmacy practice.

Although students averaged an 89% for "writing a clear and concise paper" on the OPPE, this was one of the sections with the lowest grades/performance. There are several potential explanations for this performance. Students are usually taught the fundamentals of writing in the prepharmacy English composition courses. Rarely do they get the opportunity to revisit writing again in a meaningful way. Sometimes a writing assignment is incorporated into a pharmacy administration or drug information course, but students are usually not given enough opportunities to practice writing once they enter the professional pharmacy curriculum.

While students performed lower in the area of writing, they consistently achieved the highest scores in the areas relating to professionalism (i.e., did the student display the habits, attitudes, and values of a professional; was she or he independent and self-directed; did she or he demonstrate appropriate social interaction, citizenship, and leadership skills). High scores could be related to students' expectations. The syllabus and other information about the project clearly delineated that students were expected to be self-directed and responsible for initiating contact with advisors. Also, the idea of presenting a professional poster in front of all students and faculty was a motivating factor for many students. Another reason why students may have scored high in issues related to professionalism was the relevancy of the poster project to their rotation activities. Nearly all students' poster projects represented real-

world projects from their advanced practice experience sites. Knowing successful completion of the project was not merely an academic exercise but one that directly affected their site, students may have been more driven to achieve a higher level of performance.

MODIFICATIONS

As with many new endeavors, changes were made along the way to improve the course. The primary revisions centered on grading the poster presentation and improving communication and organization.

Grading Process

When this revised course began in 1998, a panel of three evaluators used the instrument shown in Appendix B to critique all posters presented at the HSOP Poster Forum. Students were assigned a one-hour block of time to mount their posters on $4' \times 8'$ presentation boards provided by HSOP. Once the posters were mounted, the students would break for lunch while the reviewers took approximately two hours evaluating posters. This process did not influence a student's overall grade, which was determined by the poster advisor. The students would return to verbally present the posters to the evaluators and other health care professionals, students, and faculty. The scores were tabulated, and the top three poster presenters received monetary awards and a certificate distinguishing their performance at the conclusion of the poster presentations. As class size increased, this portion of the poster forum was modified due to the projected workload. Instead, the form was completed by the audience (faculty, students, etc.) as a method of providing individual feedback to the presenter for future improvement.

Communication and Organization

Based on student and faculty feedback, it was evident that additional strategies should be implemented to improve communication to students and faculty advisors at regional sites. During Year 3, the course coordinator began using a course management site called Blackboard.com. This Web site allowed the use of course pages for posting the syllabus, course readings, assignments, and schedules. It also facilitated bulletin boards and on-line chat that allowed discussion questions and communication by faculty to all students in the course. Also, the

course coordinator routinely used e-mail to provide updates and reminders pertaining to the course. We extrapolate the results from student perception surveys to loosely indicate that these changes were successful. For instance, questions 2 and 3 specifically asked about faculty interaction as a valuable learning experience and faculty guidance as sufficient to assist them with this project. In Year 1, 70-74% of students agreed that interaction and guidance were sufficient. This increased to 96% in Year 3. Also, 26% of the class agreed that faculty involvement should be greater, compared to 0% in Year 3.

Professionalism

To enhance the professional environment, the poster forum was moved to a hotel and conference center located near the School of Pharmacy. Resources were used to simulate the type of poster presentations seen at national pharmacy meetings and to encourage participation. For example, students were required to dress professionally. The date of the forum was set in conjunction with the HSOP Awards Banquet. Invitations were sent to local health care providers, pharmacists, and university faculty and administrators. All pharmacy students were required to attend the presentations so they could see the types of activities they would be completing in the future. Programs were professionally printed that included information about the poster forum, as well as the presenter names and corresponding presentation titles. Food and refreshments were provided for individuals as they viewed the presentations. By Year 3, 97% of students agreed that the project promoted professionalism, compared to 74% in Year 1.

LIMITATIONS

The results of this paper should be interpreted with caution due to limitations. While we can say student perception was positive, we do not compare performance results to years prior to implementing the poster presentation assignment. In the past, the platform presentations were not linked to specific ability-based outcomes; however, students typically performed well. Therefore, a control group was not used because it was not our intent to compare the effectiveness of poster and platform presentations.

Direct observation was used as a method to evaluate the achievement of specific ability-based outcomes. However, the number of observa-

tions and interrater reliability were not assessed, nor were the quantity and quality of advisor feedback to students in the various regions. Instead, student feedback via surveys and focus groups was used to monitor this aspect. In addition, it is inappropriate to imply that this project alone contributed to outcome achievement. Instead, it should be viewed as a result of the entire curriculum. It is also important to realize that our students differed in their educational backgrounds. In Year 3, the student class matriculated through a completely restructured curriculum. This might contribute to some of the differences seen in the perception surveys.

CONCLUSIONS

This course was initially designed to adhere to Chickering and Gamson's "Seven Principles for Good Practice in Undergraduate Education" (5). For example, contact between faculty and students and time on task were emphasized through regular advisor contact and the timetable for project completion. Student and faculty perceptions support this. More than 75% (question 3) of students believed faculty interactions were a valuable learning experience, while 78% (question 4) concluded that faculty guidance was sufficient to assist them. More than 70% (question 7) of students agreed that information and guidance adequately prepared them for the project.

Reciprocity and cooperation among students were developed during the poster presentations. Students scored highest (94-100%) on the OPPE in the areas of appropriate social interaction, citizenship, and leadership. In addition, 81% (question 9) of students felt more competent and confident in their presentation skills, and 78% (question 17) determined that this project helped them develop effective interpersonal skills. Faculty noted that "the poster format, an informal manner for presenting scientific information, leads students to develop a meaningful manuscript and present it. . . ."

Active learning was encouraged, and diverse talents and ways of learning were respected through the writing assignment and the poster forum presentation. Nearly 95% (question 20) of all students agreed that this project promoted self-learning abilities, while 93% (question 2) were challenged to use critical thinking and communication abilities. More than 80% (questions 9 and 10) of students felt more competent and confident with their literature search and retrieval and presentation skills. High expectations were communicated, and feedback was given

through frequent advisor contact, the poster forum presentation, and the OPPE form. Although most students found faculty interaction and the poster forum presentation valuable, only 56% (question 12) felt evaluation forms provided helpful feedback. This increased to 83% in Year 3. Therefore, more effort should be made to enhance the feedback process in the future. These modifications may have contributed to the enhancement of the course in a way that effectively promotes communication, social interaction, self-learning, critical thinking, and professionalism within the Advanced Practice Experiences.

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APPENDIX A
Overall Poster Presentation Evaluation (OPPE) Form

Auburn University School of Pharmacy
Overall Poster Presentation Evaluation (OPPE) Form

Student Name _____ Preceptor _____
Assess student performance based on the rating scale below. Please substantiate your assessment by providing evidence in the specified area. In addition, suggest methods of improvement in order for the student to achieve the outcome.

1 **Unacceptable Performance**	2 **Needs Development**	3 **Needs Refinement**	4 **Refined**
Student is unable to satisfactorily complete basic and routine tasks despite directed questioning. The instructor must complete the task. Remediation is necessary.	Student requires guidance/directed questioning to complete complex tasks; independently completes basic and routine tasks.	Student requires limited prompting to complete complex tasks; independently completes basic and routine tasks.	Student consistently and independently completes complex and basic tasks; Confident and automatic application of knowledge and skills demonstrates readiness for developing expertise.

Definitions:
1. Guidance- The act of helping the student complete a task in order for it to be performed correctly. The act of helping involves an "intervention."
2. Directed questioning- A process for detecting the extent of guidance a student requires in order to complete the task correctly (i.e. "coaching").
3. Limited prompting- A single thought provoking question or statement such as "Is there anything you have left out?"
4. Basic and routine tasks- Tasks that require use of standard procedures as learned through the P3 level.
5. Complex tasks- Tasks that require more than just following standard procedures; These tasks have some complexity and /or involve special circumstances.
6. Expertise- Involves highly organized structure for problem solving; requires one to intuitively and holistically select the correct response to a situation by drawing upon a catalog of experienced events that are used as paradigms for resolving problems in the present.
7. Automatic application of knowledge and skills- Knowledge and skills can be performed without stopping to think about the steps involved.

I. Evaluates biomedical literature appropriately.

A. Comprehensive search strategy

• Develops a clear, concise pharmacotherapy issue to review	1	2	3	4
• Identifies drug information needs and appropriate background information necessary for the initial search	1	2	3	4
• Designs an extensive, appropriate search strategy	1	2	3	4
• Uses pertinent tertiary sources when appropriate	1	2	3	4
• Uses pertinent secondary sources when appropriate (at least 2 databases should be used to search the primary literature)	1	2	3	4
• Uses pertinent primary sources when appropriate	1	2	3	4
• Reviews an adequate sample of sources necessary to provide an in-depth evaluation of the topic (i.e. references integral to the topic are not missed)	1	2	3	4

Section score I.A _____/28 pts.

B. Summary and evaluation of literature

• Develops clear objectives that relate to the pharmacotherapy Issue	1	2	3	4
• Summarizes purpose, study design, variables, and outcome measures	1	2	3	4
• Summarizes study results including outcome measures, tables and figures (as necessary), and conclusions	1	2	3	4
• Systematically evaluates the data, including study design and statistical analysis	1	2	3	4
• Compares own conclusions with authors' conclusions	1	2	3	4
• Synthesizes and interprets information from several sources to determine clinical and statistical significance	1	2	3	4

Section score I.B _____/24 pts.

C. Conclusions

• Answers pharmacotherapy issue and/or provides appropriate evidence-based recommendations or comments	1	2	3	4
• Includes statements regarding strength of data or need for additional data	1	2	3	4
• States the importance of topic to current or future pharmacy Practice and patient care	1	2	3	4

Section score I.C_____/12 pts.

II. Effectively communicates information

A. Writes a clear and concise technical paper

• Presents an insightful viewpoint with specific evidence to support statements	1	2	3	4
• Provides accurate and concise information	1	2	3	4
• Organizes information in a clear, logical, and flowing manner	1	2	3	4
• Uses effective transitions and clear topic sentences	1	2	3	4
• Uses correct grammar, spelling, and syntax	1	2	3	4
• Follows the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*, including appropriate reference citation	1	2	3	4
• Writes in a professional tone and avoids plagiarism	1	2	3	4

Section score II.A_____/28 pts.

B. Presents an informative poster

Poster Content

• Condenses written information into a concise poster presentation	1	2	3	4
• Chooses important points of written proposal to display in poster	1	2	3	4
• Poster style is creative and helps to attract or hold audience	1	2	3	4
• Effectively illustrates points with tables and figures	1	2	3	4
• Designs poster layout for optimal reading (i.e., text flows left-to-right and top-to-bottom, readable fonts are used)	1	2	3	4

Poster Presentation

• Uses appropriate verbal and nonverbal language	1	2	3	4
• Provides information logically and coherently	1	2	3	4
• Provides accurate information with confidence	1	2	3	4
• Responds to questions appropriately	1	2	3	4
• Demonstrates comprehension of topic (e.g., explains points)	1	2	3	4
• Demonstrates analysis of topic (e.g., compares and contrasts)	1	2	3	4
• Demonstrates synthesis of the subject matter (e.g., algorithm)	1	2	3	4
• Demonstrates evaluation of the topic (e.g., critique)	1	2	3	4

Section score II.B_____/52 pts.

III. Displays the habits, attitudes, and values of a professional

A. Independent, self-direction

• Recognizes self-limitations and responds appropriately	1	2	3	4
• Assesses one's knowledge independently	1	2	3	4
• Manages time appropriately and efficiently	1	2	3	4
• Demonstrates a self-motivated character (i.e., initiates activities to complete them; functions independently)	1	2	3	4
• Displays a sense of reliability and responsibility (i.e., meets deadlines without prodding, can be counted on)	1	2	3	4

Section score III.A_____/20 pts.

APPENDIX A (continued)

B. Appropriate social interaction, citizenship, leadership

• Hears, respects, and accepts the comments of others	1	2	3	4
• Demonstrates appropriate interpersonal and intergroup behaviors	1	2	3	4
• Accepts criticism and reacts in a professional manner	1	2	3	4
• Demonstrates accountability (i.e., holds oneself liable for tasks)	1	2	3	4

Section score III.B _____/16 pts.

Final Score: Total section scores (I.A - III.B) ÷45 =
(i.e. 21 + 18 + 9 + 21 + 39 + 15 + 12 = 135; 135/45 = 3.0; 3.0 = 85)

Grade Conversion

"A" =	**4.0 = 100**	**"B" =** 3.4 = 89	**"C" =** 2.4 = 79
	3.9 = 98	3.3 = 88	2.3 = 78
	3.8 = 96	3.2 = 87	2.2 = 77
	3.7 = 94	3.1 = 86	2.1 = 76
	3.6 = 92	**3.0 = 85**	**2.0 = 75**
	3.5 = 90	2.9 = 84	
		2.8 = 83	
		2.7 = 82	**"F" =** < 2.0 overall or
		2.6 = 81	a score of 1.0 on any
		2.5 = 80	section

Comments:

APPENDIX B
Peer/Faculty Poster Appraisal (PA) Tool

Auburn University School of Pharmacy
Peer/Faculty Poster Appraisal (PA) Tool

General Information

Name of Poster Display: _____

Name of Presenter: _____

Name of Rater: _____

Directions
The PA tool contains items that are arranged in three subcategories. The subcategories focus on: (A) overall appearance, (B) content, and (C) presentation. To systematically evaluate a poster, circle the number that best describes the degree to which each item fits the poster. The rating scale ranges from 1 to 5 (5 = strongly agree, 4 = agree, 3 = neither disagree or agree, 2 = disagree, 1 = strongly disagree). In appraising a poster, give only one rating to each criterion. If you rate an item "3" or less include a comment to summarize your observations about that criterion. Also, include remarks about the strengths of the display.

Category A: Overall Appearance

•	Display attracts and holds viewers' attention	1	2	3	4	5
•	Display is free of unnecessary detail	1	2	3	4	5
•	Appropriate color combinations used	1	2	3	4	5
•	Appealing arrangement of script and graphics	1	2	3	4	5
•	Script visible from 4 to 5 feet and free of grammatical errors	1	2	3	4	5

Subscore: _____

Category B: Content

•	Core components are clearly stated (purpose, methods, etc.)	1	2	3	4	5
•	Poster demonstrates adequate evaluation of topic (i.e., critique)	1	2	3	4	5
•	Content is logically organized and easy to understand	1	2	3	4	5
•	Display is free of spelling errors	1	2	3	4	5

Subscore: _____

Category C: Presentation

•	Uses appropriate verbal and nonverbal language	1	2	3	4	5
•	Provides accurate information with confidence	1	2	3	4	5
•	Presenter demonstrates a strong professional presence	1	2	3	4	5
•	Poster presentation disseminates information effectively	1	2	3	4	5

Subscore: _____

Final Score: _____