

The Merged Pharmacology Classroom: A Formative and Interdisciplinary Approach to Physician Assistant Education

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Introduction

Physician assistant (PA) students are required to demonstrate competence by applying didactic instruction on clinical patient assessment during summative testing and with patient encounters during the final phase of their training.

Due to the potential for causing patient due to errors in medication selection and prescription/order communication, it is vital that PA students have practical experience with these competencies before starting clinical practice.^{1,2}

This poster describes the implementation and analysis of the revision of the pharmacology curriculum at the University of Pittsburgh PA Studies Program. The Pharmacology 1 and 2 courses are taught sequentially during the 2nd and 3rd (of 6) terms. Prior to this project, the instruction was lecture-based and did not offer opportunities for the interprofessional application of course material to practical patient scenarios.

The Merged Pharmacology Classroom

Features of this instructional model included:

- On-demand video lectures to be viewed prior to class
- Active learning activities during class meetings that used patient scenarios (see Figure 1) to develop the competencies of patient evaluation, selection of appropriate medications, and the interprofessional communication of medication orders and changes
 - Communication methods included written, electronic (using a simulated electronic health record), and telephonic communication
 - For telephonic prescribing, PA students partnered with student pharmacists for prescribing and prescription clarification exercises.

Activity: Surgical Rotation Case

Eliana had a femoral-popliteal bypass graft performed on her right leg four days ago to treat severe intermittent claudication. She presented via the emergency department today with complaints of drainage from her surgical site. She was found to be febrile and was admitted for treatment of a non-healing surgical wound with suspected overlying infection. She is also diabetic and will need frequent assessments, medication administration and wound care. Can you help Eliana? Provide new, electronic orders for Eliana's care.

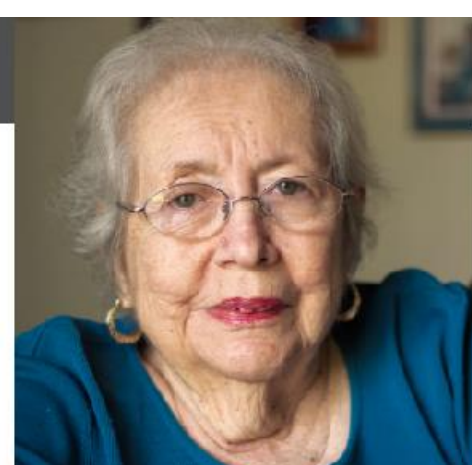


Figure 1. Example Introduction to a Clinically-Oriented Patient Scenario.

Methodology

Evaluation of the course redesign was performed using the following plan:

- Comparison of the results of Student Opinion of Teaching surveys between the 2017 and 2018 offerings of the Pharmacology 1 and 2 courses
 - These anonymous surveys are administered in the last weeks of a corresponding term by a central office at the university
- Semi-structured interviews (n=9) of PA students after they had completed six months of clinical rotations to evaluate their perception of the Merged Pharmacology Classroom model and its impact on preparing them for their clinical education
 - These were performed in in July 2019
 - Interviews were recorded via field notes and inductively coded to identify themes
- First year student pharmacists (n = 113) were surveyed using a Likert scale on their perception of the impact of the experience on interprofessional collaboration

PA Student Opinion of Teaching Survey Items

Level of agreement is indicated for each of the following:

- Q1: The instructor stimulated my thinking.
- Q2: The instructor was enthusiastic about teaching the course.
- Q3: The instructor presented the course in an organized manner.
- Q4: The instructor maintained an environment where students felt comfortable participating.
- Q5: The instructor maintained an environment where students felt comfortable seeking assistance.
- Q6: The instructor provided helpful feedback.
- Q7: Assignments contributed to my understanding of the subject.
- Q8: Express your judgment of the instructor's overall teaching effectiveness.

Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree

Results

Changes in Response Means of PA Student Opinion of Teaching Survey Responses

Course	2017	2018	p	2017	2018	p
	Pharm 1 n= 31	Pharm 1 n= 44		Pharm 2 n=44	Pharm 2 n=21	
Q1	3.87	3.95	0.703	4.3	4.33	0.887
Q2	3.35	4.07	0.003	3.95	4.23	0.304
Q3	4.16	3.8	0.082	4.55	4.41	0.411
Q4	3.13	3.8	0.005	4.02	4.41	0.138
Q5	2.84	3.39	0.020	3.8	4.27	0.104
Q6	2.97	3.5	0.032	3.59	4.18	0.079
Q7	3.61	3.91	0.204	4.11	4.19	0.723
Q8	3.06	3.4	0.156	3.89	3.95	0.891

Results of Thematic Analysis of PA Student Interview Responses

Self-Guided Learning	<ul style="list-style-type: none"> • Ability to watch videos at own pace • Re-watch videos as needed • Schedule videos during times convenient to life
Application of Material	<ul style="list-style-type: none"> • Similar activities to clinical rotations • Differing patient presentations for different clinical decisions
Problem-Based Learning	<ul style="list-style-type: none"> • Working in groups helped with understanding

Summary of Survey Responses of Student Pharmacists

- 113 first year PharmD students interacted asynchronously with PA students to learn best practices in transcribing verbal prescription orders. Of the 80 respondents, 79% agreed that the interprofessional exercise was an effective method to improve awareness to other health profession students.
- 115 second year PharmD students worked asynchronously with the same PA students to practice communication in the electronic health record to correct a medication error. Of the 41 respondents, 68% agreed that this exercise was an effective tool to improve interprofessional skills.

Conclusions

In general, the response means to the Student Opinion of Teaching survey items increased or remained close to their baseline when compared between the class years. Statistically, there were significant increases in the responses to the questions regarding the classroom environment and comfort asking questions, comfort seeking assistance, and the provision of helpful feedback between the Pharmacology 1 courses. The themes that arose from the interviews of the students after completing six months of rotations support this model.

PA students were more stimulated and better understood the pharmacology lessons using the flipped classroom instruction than by lecture-based instruction, and the interprofessional education of the student pharmacists was positively impacted by this project. As this was a pilot project, these positive preliminary findings contributed to the decision to maintain this model for the incoming PA student and student pharmacist cohorts, after some revisions to the course content and messaging to increase the perception of organization

Further analysis of the impact of the flipped model of instruction and the interprofessional experiences will focus on student outcomes, including comparison of scores on standardized end-of-rotation exams and clinical knowledge assessment tool, as well as the national certifying examination.

Acknowledgements

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References

1. Wiernik, P. H. (2015). A dangerous lack of pharmacology education in medical and nursing schools: A policy statement from the American College of Clinical Pharmacology. *The Journal of Clinical Pharmacology*, 55, 953-954. doi:10.1002/jcph.539
2. Nanji, K. C., Rothschild, J. M., Salzberg, C., Keohane, C. A., Zigmont, K., Devita, J.,...Poon, E.G. (2011). Errors associated with outpatient computerized prescribing systems. *Journal of the American Medical Informatics Association*, 18, 767-773. doi:10.1136/amiajn-2011-000205