



Comparing Three Pedagogically Different Pharmaceutical Calculations Courses across Three Colleges of Pharmacy

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MAIN TAKEAWAYS

1. Three different pedagogical approaches to teaching foundational pharmaceutical calculations in the first professional year are described.
2. Students across all 3 schools had similar preferences for course structure, study resources, and course assessment, regardless of the pedagogical approaches of their own schools.
3. Though each college of pharmacy used very different approaches to pedagogy and assessment, surveyed students preferred to have dedicated class time, practice questions with answers, frequent quizzes/homework, a practice exam, a cumulative final exam, and continued access to materials in a learning management system.

STUDY OBJECTIVES

1. To describe the pedagogy and assessment strategies used in foundational calculations courses across three colleges of pharmacy
2. To compare differences in student satisfaction survey responses and assessment data across all three colleges

METHODS

- Pedagogical approaches and assessment data across the three institutions were gathered and compared by the authors, who also served as their respective calculations course coordinators.
- IRB approval was obtained by all institutions.
- An optional, anonymous, online student satisfaction survey was administered to students from all three schools approximately one month after successfully completing their Fall 2021 calculations course.
- Respondents rated the helpfulness of various resources and pedagogical approaches using Likert scale survey questions.
- Responses were converted to numerical scale for analysis.

RESULTS

Pedagogical Characteristics	Belmont	Pitt	Wingate
Physical Location	In-person	In-person	Online
Primary Timing	Synchronous	Synchronous	Asynchronous
Course Format	Lecture Small group work (practicum)	Lecture Small group work (practicum)	Self-study videos Optional recitation
Total Duration over which Calculations was Taught	1 semester	6 consecutive weeks	5 consecutive semesters
Assessments	Individual homework Small group work Midterm exam Cumulative final	Individual homework Small group work Cumulative final	Individual quizzes Cumulative final
Minimum Competency	70%	80%	≥69.5
Question Format	Constructed response	Constructed response	Constructed response Matching Multiple choice

Heat Maps Portray Results from Student Preference Survey (Most to Least Preferred)

Ranking	Resource	Belmont	Pitt	Wingate
1	Practice questions with answers	1	1	2
2	Continued access to materials for duration of degree	3	4	1
3	Practice exam	2	1	6
4	Homework/quiz answers within 1 week of submission	4	3	3
5	Study guide	5	7	5
6	In-person practicum	7	7	4
7	Learning management software course	8	11	8
8	Recordings of class	6	9	11
9	Review session	9	5	9
10	Weekly quizzes/homework	12	10	7
11	Self-study on-demand videos/slides	10	6	9
12	Supplemental videos	11	13	12
13	In-class group work	13	12	14
14	Tutors	15	15	13
15	Practice questions without answers	14	16	16
16	Cumulative final exam	16	13	15
17	Textbook	17	17	17

Ranking	Course Structure	Belmont	Pitt	Wingate
1	Dedicated class time for calculations content that is embedded within a larger course	2	1	1
2	Dedicated calculations course that does not include other content	1	1	2
3	Primarily self-study calculations content embedded within a larger course	3	3	3

Ranking	Content Assessment	Belmont	Pitt	Wingate
1	Weekly quizzes/homework and cumulative final exam	3	1	1
2	Weekly quizzes/homework, midpoint exam, and cumulative final exam	2	2	2
3	Biweekly quizzes/homework and cumulative final exam	4	3	3
4	Biweekly quizzes/homework, midpoint exam, and cumulative final exam	1	4	4
5	Midpoint exam and cumulative final exam	5	5	5

DISCUSSION

- Though pedagogical approaches have been described in the literature, this is the first pedagogy comparison between three colleges of pharmacy¹⁻⁶
- There is no "one size fits all" approach to calculations content delivery but regular feedback does support student learning⁷
- Using examples like these and considering their own needs and resources, institutions must determine what pedagogical approach is best
- Colleges may also consider the consistent themes in student perceptions in order to potentially increase student satisfaction and engagement

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