

ACADEMIC OUTCOMES OF A TWO-WEEK 'SOFT SKILLS' AND SELF-STUDY MODULES PROGRAM INTO THE FIRST SEMESTER OF PHARMACY SCHOOL

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Introduction

- The Accreditation Council for Pharmacy Education (ACPE) regularly evaluates the quality of Doctor of Pharmacy programs at colleges and schools of pharmacy in the United States and encourages continuous improvement in order to uphold standards.
- The ACPE Standards 2016 emphasized the importance of program faculty regularly revisiting and revising their institution's curriculum design, delivery, and sequencing to ensure educational goals are met.
- Due to a decrease in pharmacy school applicants, incoming students, may require additional preparation for the rigors of the Doctor of Pharmacy coursework.
- The Curriculum Committee and faculty at Touro University California College of Pharmacy (TUC-COP) revised the curriculum and implemented a two-week 'Soft Skills' and Self-Study Modules Program into the first semester starting Fall 2019 to improve student's foundation.
- No studies to date have evaluated the implementation of soft skills' and self-study modules in the initial first year pharmacy (P1) semester curriculum or assessed its effects on academic outcomes.

Objective

- This study assesses the impact of the curriculum change on the academic performance of pharmacy students on selected lectures while accounting for other confounding variables.

Methods

Design

- The change in curriculum design at TUC-COP took effect Fall of 2019.
- Pre/post study intervention study was conducted at TUC-COP using first year of pharmacy school data from the Class of 2022 (n=81) and Class of 2023 (n=70).
- Academic performance on 41 lectures were evaluated from the Fall semesters of 2018 and 2019 respectively for P1 students in Class of 2022 and 2023, and were compared in a retrospective manner.
- Student performance was evaluated based on grades earned on specific lecture exam questions in which both classes were taught.
- Demographics and academic characteristics were extracted from The Pharmacy College Application Service (PharmCAS) Applicant Data Report.
- Data points were analyzed to determine predictors for academic performance in Fall P1 year.
- All statistical analyses were conducted using STATA IC Version 14.0.

Inclusion Criteria

- Class of 2022 and 2023 Doctor of Pharmacy students enrolled at TUC-COP.

Exclusion Criteria

- Students repeating at least one course, taking a leave of absence, remediating a course, or dismissed from the Doctor of Pharmacy during their first year of pharmacy school.

Demographics

- There were a total of 151 P1 students from Class of 2022 and Class of 2023 evaluated in this study.

Baseline Characteristics	
Gender, n (%)	
Female	92 (60.9%)
Male	59 (39.1%)
Age, n (years ± SD)	
	25.4 ± 4.7
Native Language, n (%)	
English	92 (60.9%)
Other	59 (39.1%)
Race, n (%)	
White	29 (19.2%)
Black	12 (8.0%)
Hispanic	6 (4.0%)
Asian	103 (68.2%)
Other	1 (0.7%)
Highest Degree Earned, n (%)	
Less than Bachelors Degree	12 (8.0%)
Bachelors Degree or above	139 (92.1%)
Citizenship Status, n (%)	
Permanent U.S. Resident	14 (9.3%)
U.S. Citizen	137 (90.7%)
Economic Disadvantage, n (%)	
Disadvantaged	50 (33.1%)
Not Disadvantaged	101 (66.9%)

18 out of 41 Lectures Were Found Statistically Significant

PRMC 601 – Biological Sciences 1

Lecture	Class of 2022 (N=81) (%Correct ± SD)	Class of 2023 (N=70) (%Correct ± SD)	p-value
Biosynthesis of DNA, RNA and Proteins	60.7% ± 21.1 [^]	78.6% ± 15.2	<0.001
Cell Pathology: Responses to Stress, Injury and Cell Death	73.7% ± 17.8 [^]	85.1% ± 18.6	0.0002
Immune Tolerance and Autoimmunity	67.9% ± 26.0 [^]	83.1% ± 20.6	<0.001
Inflammation	72.5% ± 22.9 [^]	82.4% ± 10.4	0.0011
Dermatological System and Dermatitis	77.3% ± 20.4 [^]	86.7% ± 15.4	0.002

PRMC 602 – Pharmaceutical Sciences 1

Lecture	Class of 2022 (N=81) (%Correct ± SD)	Class of 2023 (N=70) (%Correct ± SD)	p-value
Basic PK	99.0% ± 4.36	81.4% ± 19.8*	<0.001
Enzymes and Drug-induced Enzyme inhibition	76.0% ± 19.1 [^]	85.4% ± 18.8	0.003
Drug-Drug Interactions	85.2% ± 21.1	63.9% ± 31.7*	<0.001
Life of a Pill Exercise	95.7% ± 9.51	75.7% ± 29.2*	<0.001
Pharmaceutics – Introduction/Terms	86.4% ± 26.2	75.4% ± 25.0*	0.009
Adrenergic Medicinal Chemistry	69% ± 22.3 [^]	82.1% ± 21.9	<0.001

PRMC 604 – Clinical Sciences 1

Lecture	Class of 2022 (N=81) (%Correct ± SD)	Class of 2023 (N=70) (%Correct ± SD)	p-value
Clinical Laboratory Medicine 2	57.1% ± 29.1 [^]	70.4% ± 21.2	0.002
Clinical Laboratory Medicine 3	52.5% ± 23.8 [^]	82.1% ± 16.8	0.003
Drug Literature Evaluation	66.2% ± 25.2 [^]	78% ± 22.4	<0.001
Drug Information	68.8% ± 27.0 [^]	91.5% ± 10.4	<0.001
Immunization Lecture #1	96.9 ± 8.28	79.9 ± 15.9*	<0.001
Immunization Lecture #2	66.7 ± 17.9 [^]	78.3 ± 17.6	<0.001
Vertical/Horizontal SOAPING	61.0 ± 20.1 [^]	76.7 ± 19.6	<0.001

- (*) Indicates lectures that Class of 2023 P1 students that were effected by the curriculum change in Fall 2019 performed poorly in comparison to Class of 2022 P1 students during Fall of 2018.
- (^*) Indicates statistically significant lectures that Class of 2023 P1 students performed better on, especially in PRMC 601 – Biological Sciences 1 course, when compared to Class of 2022 P1 students during Fall of 2018.

Results

Effects of confounding variables (PCAT composite score, Pharmacy Pre-requisite GPA, Post-Baccalaureate GPA and Cumulative Graduate GPA) on academic performance.

Variables	Frequency (Mean GPA or Score ± SD)	Coefficient	Confidence Interval	p-value
PCAT Composite Score (N=25)	413.8 ± 18.7	-0.0002	-0.004 – 0.004	0.890
Pharmacy Pre-requisite GPA (N=146)	3.09 ± 0.43	-0.0433	-0.171 – 0.085	0.401
Post-Baccalaureate GPA (N=55)	3.51 ± 0.60	0.0345	-0.283 – 0.352	0.778
Cumulative Graduate GPA (N=146)	3.23 ± 0.32	0.2505	-0.055 – 0.492	0.091

Multivariate linear regression was used to assess the effects of the variables (PCAT composite score, Pharmacy Pre-requisite GPA, Post-Baccalaureate GPA and Cumulative Graduate GPA) on academic performance on the selected lectures. These variables were not found to be statistically significant predictor of academic performance on the selected lectures in Fall P1 semester.

The cumulative score performance on the selected 41 Lectures during the P1 Fall semester for Class of 2022 and Class of 2023.

Groups	Frequency (Mean (%) ± SD)	Confidence Interval	p-value
Class of 2022 (n=81)	79.3% ± 7.43	0.777 – 0.809	0.021
Class of 2023 (n=70)	82.4% ± 8.95	0.803 – 0.845	

Class of 2023 (n=70), which was effected by the TUC-COP curriculum change, overall scored higher on the 41 lectures analyzed in this study 82.4% vs. Class of 2022 (n=81) 79.3%. This result was found to be statistically significant, p-value 0.021.

Discussion/Conclusion

- The implemented curriculum revision at TUC-COP during Fall semester 2019 could be a contributing factor in improving student's foundational knowledge as shown by Class of 2023 displaying higher cumulative academic performance in comparison to Class of 2022.
- Of the total 41 lectures analyzed in this study comparing the performance of Class of 2022 and 2023 Fall in P1 semesters, 18 were found to be statistically significant.
- From the total 41 lectures evaluated, Class of 2023 demonstrated improvement on 25 lectures, no difference on 1 lecture and worse performance on 15 lectures in comparison to Class of 2022.
- Future studies should investigate the long-term effect of curriculum revision advised by ACPE Standards 2016 on the academic performance of Doctor of Pharmacy students.

References

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