RESEARCH

Impact of Time Allocation Practices on Academic Outcomes for Students from a 2-Campus Pharmacy School

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Objective: To assess how students from 2 campuses spent their time during P1-P3 (first through third) years, and whether that time allocation impacted their APPE grades and NAPLEX performance.
Methods: Data from 2 graduating classes were gathered, including baseline student demographics, academic performance, licensing examination scores and pass rates, and an annual internal student survey. For the survey, students were asked how much time they spent each week on class attendance, watching recorded lectures, studying and course-related activities, school-sponsored extracurricular activities, and work. Data was analyzed by campus for the 3 years (P1-P3) and then evaluated separately as individual academic years.
Results: There were statistical differences between campuses in attending class, watching recorded lectures, and participating in school activities. However, there was no statistical difference between the 2 campuses in APPE grades, NAPLEX scores, or pass rates.
Conclusion: How students from these 2 campuses spent their time during pharmacy school was not predictive of academic success.

Keywords: distance education; satellite; time allocation

INTRODUCTION

Colleges and schools of pharmacy are required to provide future pharmacy practitioners with knowledge, skills, and abilities necessary to be competent and confident, and to foster social and professional attitudes and behaviors befitting future pharmacists. At the same time, students join organizations for social and leadership opportunities and typically work during pharmacy school to gain practical experience and/or to support their education. Therefore, it is important for schools to observe and understand how students allocate their time and the effect that time allocation has on their achievement of academic outcomes.

Not only does each school present its doctor of pharmacy (PharmD) program with a unique approach, schools with distance campuses may employ different techniques for educational delivery between campuses. In 2010, Harrison et al determined that there were 20 schools with distance campus programs, of which 16 ran parallel campuses, resulting in separate student cohorts for all 4 years of the PharmD program. Of those 16 schools, 12 delivered content synchronously, 1 school delivered content asynchronously, and 3 schools delivered content in a hybrid of both synchronous and asynchronous transmissions.[1] According to the Accreditation Council for Pharmacy Education's (ACPE) 2014 roster of pharmacy programs, there were 34 schools with at least 1 distance campus, and 7 of those schools had multiple distance sites, for a total of 41 distance campuses among the 130 preaccredited and accredited professional programs of colleges and schools of pharmacy.[2] This continued and substantial growth illustrates the importance of understanding the potential impact of the student experience at multi-campus schools on academic performance. ACPE requires in Guideline 3.6, and throughout its Standards, ". . .comparison and establishment of **substantial comparability** of alternative program pathways to degree completion, including geographically dispersed campuses and distance-learning activities." ACPE also promotes "professional behavior and harmonious relationships," stating in Guideline 23.4 that "the college or school should implement strategies and programs to broaden the professional horizons of students . . . through guest lecturers, participation in curricular and extracurricular activities, service learning, and other beneficial activities." Despite varying approaches to

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distance education, schools still must meet ACPE requirements and produce competent entry-level pharmacy practitioners.[3]

Reid and colleagues showed the delivery method of a course does not correlate with academic performance when they compared academic data of students in the P1 of the PharmD curriculum at the traditional campus versus distance campuses of the University of Florida College of Pharmacy.[4] This program is a hybrid delivery method with lectures recorded at the main campus and delivered asynchronously to distance students. The campus assignment did not impact the P1 students' GPA.[4] Creighton University created online cases to assess learning outcomes related to the P1 and P2 curriculum for on-campus students and distance students. Distance students performed better than students on campus particularly in P1. This gap narrowed but was still significant in the P2 data. The authors concluded that distance students were not negatively impacted by the delivery method.[5] Congdon and colleagues evaluated the impact of a hybrid delivery at the University of Maryland School of Pharmacy (UM SOP) on P1 students. There was no difference in grade point average (GPA) or preceptor evaluations of students in introductory pharmacy practice experiences (IPPE). Furthermore, time allocation and stress levels were assessed and found to be similar between campuses for P1 students. The only difference in time allocation was class attendance and watching recorded lectures.[6]

In the Fall 2007, UM SOP opened a distance education campus at the Universities at Shady Grove in Rockville, MD. [7] Nearly all lectures were given at the main campus, and Mediasite technology (Sonic Foundry, Madison, WI) was used to record a substantial portion of its PharmD curriculum. The main campus in Baltimore is an urban academic health center while the distance campus in Rockville, MD is suburban. More than 20 student organizations within UM SOP offer about 800 extracurricular events and activities to students on both campuses throughout the academic year, as well as college-hosted endowed lectures and nonpharmacy campus opportunities. To address the need to monitor students' academic performance in the PharmD program and success in school activities and organizational and professional events, and to understand differences in the student experience in different educational environments, an annual student survey was developed at the inception of the UM SOP distance campus. There are no studies of students who have completed a hybrid PharmD program that analyze the impact of time allocation practices on academic success in advanced pharmacy practice experiences (APPEs) and on the North American Pharmacist Licensure Examination (NAPLEX). The purpose of this study was to investigate our hypothesis that variable time allocation by P1-P3 students from 2 distinct campuses did not have an impact on P4 (fourth year) APPE grades and NAPLEX scores and pass rates.

METHODS

This study focused on 2 UM SOP graduating classes (2011 and 2012), each of which consisted of a main campus cohort and a distance campus cohort. There were 4 sources of data for this analysis: baseline student demographic and admissions data, PharmD academic performance data, NAPLEX examination scores and pass rates, and an annual internal student survey. Baseline student demographic and admissions data and identified academic data were obtained from the college's enrollment management system. NAPLEX scores were obtained from the National Association of Boards of Pharmacy (NABP) after submission of signed student authorizations for NABP to release information to UM SOP. PharmD students in their P1, P2, and P3 years individually completed an annual online survey about the student experience via the Qualtrics online survey tool (Qualtrics, LLC, Provo, UT). Titled the "Continuing Student Survey" (CSS), the survey included questions modeled on the American Association of Colleges of Pharmacy's (AACP) Graduating Student Survey as well as questions of strategic importance to the school. The latter included topics such as study habits, stress levels, and time allocation practices. Time allocation category options included: attending class, watching lecture videos (recorded in Mediasite), studying, group projects, or other course-related work, school-sponsored activities (student organizations/social events), and work (excluding experiential learning). For each question related to time allocation practices, students indicated how much time they dedicated to each activity per week. Duration of time per activity per week was defined as 0-5 hours, 5-10 hours, 10-20 hours, 20-30 hours, and greater than 30 hours. An Institutional Review Board waiver was obtained because this was a retrospective evaluation study.

In order to detect differences or similarities in time allocation responses, self-reported class year and campus cohort were used for separation of CSS data; identifiable baseline and admissions data and academic performance data were similarly grouped. Data were analyzed by main campus vs distance campus, then divided and evaluated separately as P1 vs P2 vs P3 by campus. Time allocation categories were grouped into less than 10 hours per week (0-5 hours and 5-10 hours) and greater than 10 hours per week (10-20 hours, 20-30 hours, and greater than 30 hours). Self-reported time allocation data were compared by campus and class year (P1, P2, and P3) for the combined

Table 1. Prepharmacy Demographic Data for 2011 and 2012 Classes

	Main Campus (n=235)	Distance Campus (n=71)	*p* value
Prepharmacy GPA (average ± SD)	3.4 ± 0.4	3.3 ± 0.4	0.40
Biology PCAT Score (average ± SD)	83 ± 12	81 ± 14	0.38
Chemistry PCAT Score (average ± SD)	87 ± 10	84 ± 13	0.17
Composite PCAT Score (average ± SD)	87 ± 8	85 ± 8	0.04
Female (%)	71	62	0.17
White (%)	43	31	0.08
Black (%)	10	13	0.49
Asian (%)	35	39	0.53
Other (%)	12	17	0.32

data. Performance on APPEs and NAPLEX were compared by campus. Chi-square, Fisher's exact and the Mann-Whitney U tests were used for statistical analysis (Prism 6.0, La Jolla, CA).

RESULTS

Table 1 illustrates prepharmacy baseline demographics for students at the main vs distance campus. All demographics were similar between the 2 campuses, except for the average Pharmacy College Admission Test (PCAT) composite score (main campus 87, distance campus 85, $p=0.04$). Response rates on the CSS were also similar between campuses for individual class years and when combined (Table 2). Table 3 illustrates the percent of students' time allocations on each activity by class cohort and campus.

Each class year and campus cohort spent an average of 44-48 hours per week on activities associated with pharmacy school. Time spent attending class was significantly higher at the main campus in the P1 and P2 years ($p<0.0001$ and $p=0.0037$, respectively) but not for the P3 year. Time spent watching online lectures was significantly higher among students at the distance campus for P1 through P3 years ($p=0.0006$, $p=0.0021$, and $p=0.0008$, respectively). There were no significant differences between the campuses for studying, school-sponsored activities, or time spent working outside of school for any given class year. When data for P1 through P3 were combined and separated by campus, there were statistical differences for attending class ($p<0.0001$), watching lectures online ($p<0.0001$), and for school-sponsored activities ($p=0.04$). Students at the main campus spent more time attending class, while students at the distance campus spent more time watching lectures online and participating in school-sponsored activities. Figures 1 and 2 illustrate the time allocation for each of the specified areas by campus designation.

There was no difference in average APPE grades between the 2 campuses, with both having an average of 3.8 out of 4.0 ($p=0.17$). The average NAPLEX score by campus of the 269 students who released their scores were 2 points apart (distance campus=103 and main campus=105; $p=0.47$). Further, NAPLEX pass rates between the 2 campuses were also similar (distance campus=97% and main campus=98%; $p=0.63$).

DISCUSSION

This study's results showed that there was a difference in time spent attending class for the P1 and P2 years by campus, but not for the P3 year. This difference was expected because of the design of the curriculum delivery at the 2 campuses. In the first 2 years of the curriculum, much of the material is recorded and posted to a secure server for students at both campuses to view. However, in the third academic year, there is more required discussion-based active learning necessitating the students to be physically present in the classroom.

There was also a difference between campuses in the amount of time spent watching recorded lectures. This difference can be explained by students at the distance campus primarily accessing recorded lecture material on Mediasite. Although this difference was expected, it is important to note that main campus students also had full access to the recorded material on Mediasite.

In addition, a greater proportion of students from the distance campus participated in school-sponsored activities.

Table 2. Response Rates (%) for Continuing Student Survey for 2011 and 2012 Classes

	Main Campus Respondents (n=235)	Distance Campus Respondents (n=71)	*p* value
P1	56	55	0.90
P2	37	37	1
P3	51	62	0.12
P1, P2, P3 Combined	50	51	0.41

Table 3. Time Allocation Practices of Students

	Main Campus (%)		Distance Campus (%)		
Class/Activity	**<10 hours/wk**	**>10 hours/wk**	**<10 hours/wk**	**>10 hours/wk**	***p* value**
P1 Attending Class	49	51	97	3	<0.0001
P2 Attending Class	68	32	96	4	0.004
P3 Attending Class	56	44	82	18	0.99
P1-P3 Attending Class	56	44	91	9	<0.0001
P1 Watching Lecture Videos	61	39	30	70	0.001
P2 Watching Lecture Videos	45	55	12	88	0.0021
P3 Watching Lecture Videos	66	34	38	62	0.001
P1-P3 Watching Lecture Videos	59	41	29	71	<0.0001
P1 Studying/Group Projects	63	37	66	34	0.73
P2 Studying/Group Projects	46	54	50	50	0.71
P3 Studying/Groups Projects	59	41	73	27	0.09
P1-P3 Studying/Group Projects	57	43	65	35	0.15
P1 School-sponsored Activities	95	5	98	2	1
P2 School-sponsored Activities	94	6	100	0	0.34
P3 School-sponsored Activities	90	10	98	2	0.12
P1-P3 School-sponsored Activities	93	7	98	2	0.04
P1 Work	76	24	66	34	0.22
P2 Work	78	22	81	19	1.0
P3 Work	84	16	76	24	0.21
P1-P3 Work	79	21	73	27	0.17

This difference was not detected when examining individual years because the groups were too small to detect it. This could be explained in part by the small number of students at the distance campus. Also, it could be a result of the school's dedicated effort to ensure students at the distance campus have equal opportunities in school-sponsored activities, and an understanding among these students of the importance of extracurricular events for professional development.

Demographic data between the 2 campuses were similar for average prepharmacy GPA, average biology PCAT, average chemistry PCAT, percentage of female students, and ethnicity classifications. However, the average composite PCAT scores were statistically different between the 2 campuses (87 at main campus and 85 at distance campus). The authors attributed the study's 2-point statistical difference to a small sample size at the distance campus, and concluded that this is not an impacting factor. This is distinguishable from the study by Ried et al, who found a significant 8-point difference between their main and distance campuses' composite PCAT scores (88.2 at main campus vs 79.7 at distance site).

APPE scores, NAPLEX scores, and NAPLEX pass rates were used as performance outcomes for this study as a representation of the achievement of terminal outcomes, knowledge, and skills. There was no difference between campuses on any of these indicators of performance.

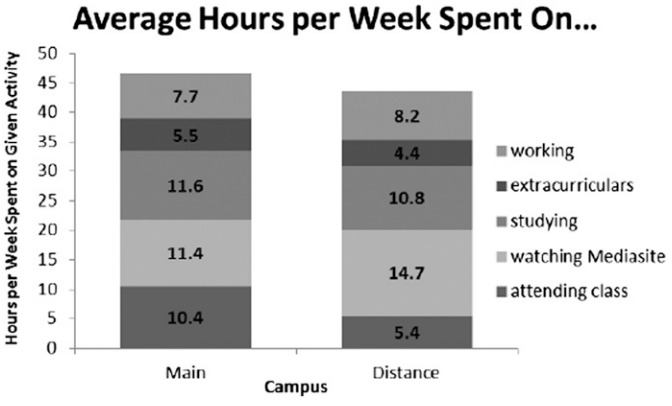

Figure 1. Time allocation practices by campus.

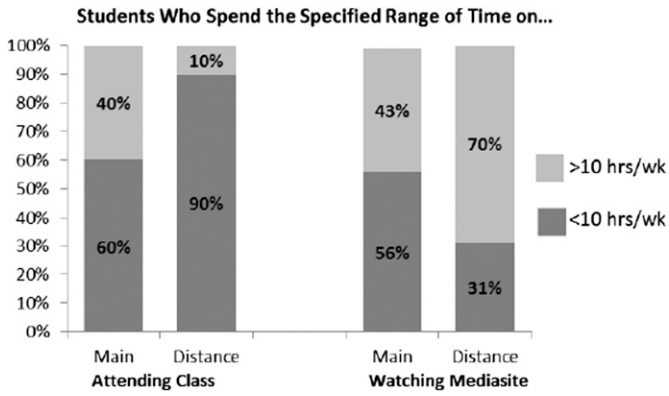

Figure 2. Time allocated to attending class and watching recordings by campus.

As outlined in Table 2, the overall response rates for the CSS varied by academic class year (P1, P2, P3, P1-P3 combined); however, rates were proportionate between the 2 campuses. The authors acknowledged that variability in response rates were a potential limitation of the study. Another potential limitation of the study was that no power analysis was performed prior to analyzing time allocation data. Therefore, instances where no statistical differences were shown could potentially be attributed to lack of power. Another potential limitation refers to the ability to extrapolate the results to all colleges and schools of pharmacy with distance campuses because delivery methods elsewhere may differ from the UM SOP hybrid model. A final limitation for this study was that potentially confounding variables such as student satisfaction and stress levels were not assessed.

CONCLUSION

Although students at each UM SOP campus allocated their time differently during P1-P3 years and there were different extracurricular opportunities at each campus, similar successful outcomes were achieved for APPEs, NAPLEX scores, and NAPLEX pass rates. Class attendance vs watching lectures outside of the classroom did not impact the achievement of terminal performance outcomes. The comparable success of graduates from both campuses may be grounds for faculty members to explore innovative teaching pedagogy.

REFERENCES

1. Harrison LC, Congdon HB, DiPiro JT. The status of US multicampus colleges and schools of pharmacy. *Am J Pharm Educ*. 2010;74(7):Article 124.
2. Preaccredited and Accredited Professional Programs of Colleges and Schools of Pharmacy, Accreditation Council for Pharmacy Education. https://www.acpe-accredit.org/shared_info/programsSecure.asp. Accessed September 19, 2013.
3. Accreditation Standard and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree, Accreditation Council for Pharmacy Education. https://www.acpe-accredit.org/pdf/FinalS2007Guidelines2.0.pdf. Accessed September 19, 2013.
4. Ried LD, McKenzie M. A preliminary report on the academic performance of pharmacy students in a distance education program. *Am J Pharm Educ*. 2004;68(3):Article 65.
5. Lenz TL, Monaghan MS, Wilson AF, Tilleman JA, Jones RM, Hayes MM. Using performance-based assessments to evaluate parity between a campus and distance education pathway. *Am J Pharm Educ*. 2006;70(4):Article 90.
6. Congdon HB, Nutter DA, Charneski L, Butko P. Impact of hybrid delivery of education on student academic performance and the student experience. *Am J Pharm Educ*. 2009;73(7):Article 121.
7. Knapp DA, Roffman DS, Cooper WJ. Growth of a pharmacy school through planning,cooperation, and establishment of a satellite campus. *Am J Pharm Educ*. 2009;73(6):Article 102.