

Instructional Redesign Submission
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Articulation of Teaching Problem

Over the period of 2016-2018 there was a decline in standardized test scores achieved by Doctor of Pharmacy (PharmD) students on a written assessment administered with no associated individual student stakes.

Context

In 2016, the Accreditation Council for Pharmacy Education (ACPE) mandated that all third-year PharmD students be administered the Pharmacy Curricular Outcomes Assessment (PCOA). The purpose of the PCOA is to verify that students have received required didactic content during Doctor of Pharmacy training. Schools report results annually to ACPE and include them in accreditation self-studies. While this exam is administered by a third party and the test bank is secured, individual schools determine student accountability at the institutional level. In other words, schools may determine whether to administer the assessment as high or low/no stakes tests. In addition the PharmD curriculum in place from 2016-2018 at Ohio State did not have any required cumulative written exams that could prepare students with the opportunity to practice for a comprehensive knowledge exam such as PCOA. The remainder of this submission discusses the instructional redesign process used to address the issue of declining scores under the conditions of low/no stakes standardized testing.

Background

In the period of 2016-2018, Ohio State University College of Pharmacy (OSU-COP) experienced a decline in student performance on PCOA. **See Figure 1.** In spring of 2018, student focus groups were conducted to determine what factors might be contributing to the declining test scores. The results of the focus groups were informative in terms of revealing student attitudes surrounding their approach to the exam. Students reported that they were uncertain about how to prepare for a comprehensive knowledge exam. Additionally, students adopted strategies such as skipping questions that required higher levels of mental effort. For example, students reported that they would simply choose an answer and move on if a question required reading a case or performing a calculation rather than actually engaging in problem solving to select an answer.

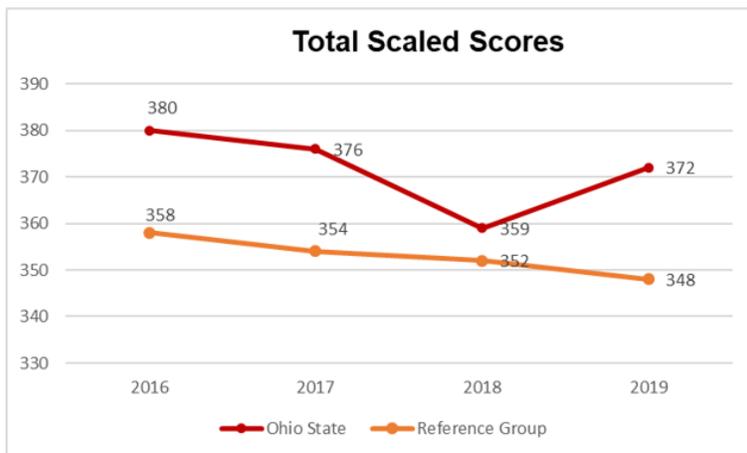


Figure 1. Pharmacy Curricular Outcomes Assessment 2016-2019

Instructional Redesign Pathway

To solve this educational problem, the following resources were consulted.

Literature consulted

The work by James Lang, Small Teaching, provided summaries of educational theories to help understand what might be underlying declining student performance on PCOA. This work served as a foundation to support the notion that students needed opportunities to practice taking comprehensive knowledge exams prior to a long (three hour) exam. In addition, the principles of testing and interleaving were also important to further understanding how the program was not adequately preparing students to do their best on this type of major milestone exam.

The second consideration was to examine the pharmacy literature on no stakes versus incentivized assessments. Given that the PCOA is used by specialized accreditation to determine program effectiveness, creating conditions under which students are incentivized to perform their best seems to be a sound strategy. Scott et al 2010 documented the limitations of using non-incentivized test scores for program evaluation. Waskeiwiz, 2011 examined the impact of incentives to perform on no stakes assessments and concluded that incentives did motivate students to do well thus asserting that incentivizing performance should be considered best practice. And finally, Sansgiry et al 2006 compared the impact on student performance of changing from no stakes to either rewards or academic consequences (e.g., not progressing in the curriculum). The largest gains in scores were for those students not permitted to progress in the curriculum without achieving a passing score.

Learning Community consultation

The Big Ten Academic Alliance Pharmacy Assessment Collaborative (comprised of the ten Big Ten pharmacy schools who have PharmD programs) worked collectively over the period of 2016-2019 to compare processes of exam delivery and individual student stakes as well as outcomes. Many conversations and deliberations were conducted to determine best practices that would encourage students to perform to the best of their ability while inducing a minimum of test taking anxiety.

Instructional Redesign Implementation

As part of an overall professional curriculum revision, the college implemented a series of program-level assessment courses into the three didactic years of the program. The previous curriculum had a practical assessment course called capstone at the end of the third professional year. The design of capstone assessments provided good alignment to program-level outcomes however, student preparation for capstone was lacking. In other words, students were not consistently given the opportunities for interleaving or practice. The new curricular design provides for an additional laboratory course sequence increasing the previous two semesters to six as well as the addition of the series of program-level assessments (PLAs) which are 1 credit hour courses at the end of each didactic year. The PLA courses combine written and practical assessments which leverage interleaving. All PLA topics have been practiced or assessed in the courses leading up to each PLA. The addition of cumulative, year-end final written exams to the PLAs in years one and two provide valuable practice for the third year standardized PCOA.

For the 2019 administration of PCOA, OSU COP required that students achieve an overall PCOA scaled score greater than or equal to one standard deviation below the national mean score. If this minimum is not achieved, the student must pass a written comprehensive exam with an oral exam component in order to progress to the final program year.

For the 2019 administration of the PCOA one other Big Ten school (University of Maryland) added individual student stakes to their administration process. Maryland also set a minimum passing score and prohibited progression to the fourth year. Any student who did not achieve the minimum score was also required to pass a remediation exam.

Data Analysis

Assessment of student performance after moving from no stakes to a minimum passing score

Figure 1 shows the increase of PCOA overall scores after the implementation of a minimum passing score as well as completion of the new lab course and PLA sequences. Additionally, debrief sessions with the students immediately after completing the PCOA in 2019 revealed an overall different student approach to PCOA in 2019. More students indicated that they accessed the practice test, and students did not report skipping questions that required higher levels of problem solving (e.g. cases or calculations) as had been the case in 2018.

Both OSU COP and Maryland improved their overall PCOA scaled scores as well as their ranking within the Big Ten from 2018 to 2019 after instituting individual stakes for the students. No other schools instituted stakes over this time period.

Instructional Redesign Reflection

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The idea that students need opportunities to practice the skills they learn was reinforced by my participation in the instructional redesign process. Particularly in the professional educational environment, it is critical to give students safe places to practice and receive formative feedback. By looking at my teaching question through a scholarly lens, I was able to produce an evidence-based solution to a challenging issue that has important ramifications for the professional program. The results of the PCOA standardized exam are used in accreditation decisions for colleges of pharmacy. If students do not take the test seriously to perform their best, an inaccurate assessment of the effectiveness of a program may be made. In addition, the importance of addressing student motivation on no stakes exams is critical to being able to use the program-level data for evidence-based decision making. Otherwise we run the risk of falling victim changing curricula to fix problems that may or may not exist. Another realization from this process is that I have solidified my understanding of the importance of interleaving and refined how I think that can be operationalized in our PharmD program. Didactic instruction combined with practice in our lab sequence that is reinforced by assessment activities in the end of year Program-Level Assessment courses is a design that is supported by the literature.

The IR process is a form of the assessment loop that has been part of my teaching toolkit for years. It is a form of evidence-based change used in an iterative fashion. This is a process that has served me well over my teaching career. I really appreciated the Teaching@OhioState materials that I was exposed to during the process. These were very high quality and easily accessible. What was most helpful about the process from UITL is that it has made scholarly teaching explicit for faculty to follow. The process provides a stepwise approach to instructional problems that faculty can follow to address educational issues or questions. This will help me in my role as the leader of the college-based Office of Educational Innovation and Scholarship. The IR process will help me guide my team of instructional designers and educational coordinators to assist faculty in identifying quality improvement projects and provide a framework to define the question, research it, plan a course of action and documented accountability. Also I am hoping to use my IR document as a sample for other faculty in our college to demonstrate that the process is not as overwhelming as it may seem. As a college that has been involved in continuous curricular improvement over an extended time, I feel like our faculty deserve to receive the incentives

the university is providing to recognize the good work they are doing. In addition, as new faculty are on boarded I plan to make them aware of the incredible resources of Teaching@OhioState.

Moving forward, I am confident in my abilities to continue the IR process moving forward. But more importantly I am confident that I can help my colleagues frame their IR projects in order to complete the portfolio.

References

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