The Relationship between Quantitative-based Admissions Criteria and Performance in a Drug Literature Evaluation Course

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The University of Mississippi

Introduction

Course Objectives

- The *Information Skills in Pharmacy Practice* course at The University of Mississippi School of Pharmacy is designed to introduce students to drug information resources as well as to provide the student with an understanding of principles of biostatistics, epidemiology, and research design.
- This course was developed and delivered by members of two academic departments, Pharmacy Practice and Pharmacy Administration, and included elements of team-based learning, independent learning, as well as more traditional instructional designs.

Course Structure

- About 50% of the class comprised clinical and basic biostatistics, about 35% covered research methods and design (primarily epidemiology research methods and clinical trials), and the remaining part of the course dealt with topics such as drug literature search and retrieval, the publication process, and sources of drug information.
- There are four assessment areas in this course:
  1. Individual and Group Quizzes
  2. Group Assignments
  3. Individual Assignment
  4. Examinations
- Individual assignments and examinations were the only numerically-graded course assessment solely based on individual effort.

Objective

To evaluate whether students' scores on quantitative-based admissions criteria are related to performance in a first-professional year drug literature evaluation course.

Methods

Sample

First-year pharmacy students' (n = 100) enrolled in a first-professional year, integrated drug literature evaluation course.

Methods

Measures

Quantitative-based Admissions Criteria

Three quantitative-based admissions criteria were obtained from the Dean's office :

1. PCAT Quantitative Ability percentile score†
2. Prerequisite statistics course letter grade
3. Prerequisite calculus course letter grade (Calculus I – primarily differential calculus)

Drug Literature Evaluation Course Grades

The following grades and average scores for each student were used in the analysis:

1. Quiz average scores (included both an individual and group-based component)
2. Group projects average scores
3. Individual assignment score (writing a review article)
4. Examination average scores
5. Final course grades (numeric and letter)

Results

Table 1 – Summary Information (n=100)

Gender	Female Male	66% 34%
Age (years)		21.6 ± 3.4
PCAT Quantitative Ability score†		49.5 ± 18.4
Drug literature evaluation examination scores		80.8 ± 7.3
Drug literature evaluation grades	A B C D or lower	15% 71% 10% 4%
Prerequisite statistics grades	A B C	83% 16% 1%
Prerequisite calculus grades	A B C	59% 32% 9%

† The average PCAT Quantitative Ability score was calculated for individuals with multiple PCAT attempts

Results

Prerequisite Statistics Course Performance

There appears to be a relationship between prerequisite statistics course performance and drug literature evaluation final course grades:

- Although there was little variation in performance in the prerequisite statistics course (83% 'A's), no students who earned a 'B' or lower in the prerequisite statistics earned an 'A' in the drug literature evaluation course, while 18.1% of the students with a prerequisite statistics course grade of an 'A' earned an 'A' in the drug literature evaluation course (Fisher exact test two-sided $p = 0.068$, 95% Exact CI: 1.02 – infinity).
- The relationship appears to be due primarily to performance on course exams and not group-based assessments (independent samples *t*-test).

Table 2 - Comparison of drug literature evaluation course averages with statistics course grades

	Prerequisite Statistics Grade	Mean (SD)	*p*-value (two-tailed)
Quiz Average	A B or lower	90.1 (3.2) 89.2 (3.4)	$p = 0.303$
Group Projects Average	A B or lower	88.5 (3.9) 89.6 (3.7)	$p = 0.313$
Individual Assignment Average	A B or lower	85.2 (7.1) 82.7 (6.5)	$p = 0.180$
Exam Average	A B or lower	81.6 (7.4) 76.9 (6.1)	$p = 0.014$

Prerequisite Calculus Course Performance

Although there was more variability in prerequisite calculus grades compared to prerequisite statistics grades, no statistically significant relationship was noted between grades in prerequisite calculus and drug literature evaluation final course grades.

Results

PCAT Quantitative Ability

There appears to be a relationship between scores on PCAT Quantitative Ability and drug literature evaluation course performance:

- Students earning 'A's in the drug literature evaluation course tended to have higher Quantitative Ability scores on the PCAT ($p = 0.004$).

Table 3 – Comparing Drug Literature Evaluation course final grade with Average PCAT Quantitative score

	Drug Literature Evaluation Course Final Grade	Mean (SD)
PCAT Quantitative ability score	A B or lower	62.0 (19.9) 47.3 (17.4)

- This is primarily explained by a positive correlation of PCAT Quantitative Ability scores with exam performance ($r = 0.22$, $p = 0.029$).

Conclusions

PCAT Quantitative Ability score and Prerequisite Statistics grades MAY be useful:

- This analysis suggests that it may be possible to use select admissions criteria, namely PCAT Quantitative Ability scores and prerequisite statistics grades, to identify individuals who might experience difficulty with a drug literature evaluation course.

Prerequisite Calculus grades MAY NOT be useful:

- Prerequisite calculus scores were not found to be associated with drug literature evaluation course performance.

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