LETTERS

Student-Driven Approach to Addressing Classroom Disturbances Suggested

To the Editor: It is without saying that classroom disturbances are annoying to students and faculty. Disturbances such as holding side conversations in class, ringing cell phones, and propping feet up on the backs of chairs during lectures alter the learning environment, making it difficult for faculty members to teach and students to learn.

For as long as there have been classroom disturbances, there have been a number of methods used by faculty members to address them. Some methods used include simply ignoring the behavior, asking students to quiet down, pausing during lecturing until the disruptive behavior ceases, meeting with the students outside of class to discuss the behavior, and even asking students to leave the classroom. Each of these methods has varying levels of success, and although they range from minimally to significantly disruptive in the manner of execution, they all share a common thread, which is that they are faculty driven and include little or no input from the student. Additionally, in each of these methods, the success or failure of the method in actually quelling classroom disturbances lies solely on the faculty member. Since students play little or no role in the development or enforcement of the method, there is no desire for them to take ownership and hold each other accountable for minimizing or eliminating classroom disruptions.

I propose that we as faculty members consider another way of addressing the problem of classroom disturbance. I propose that we use a student-driven approach to handle this problem. In a student-driven approach, the responsibility of developing a method for how to handle student disturbances would primarily lie with the student body. The student body could determine what they consider appropriate behavior in the classroom as well as what they consider appropriate consequences for those exhibiting disruptive behavior in the classroom. The faculty members should be involved in the facilitation of the method's development, advising the students on whether or not their recommendations are feasible and adhere to university policies.

Allowing the student body to develop a plan for handling classroom disturbances would be an excellent exercise in leadership and professional development. The benefits of this type of approach would be that it could make students more responsible for what happens in the classroom and hold them accountable to each other. It will teach problem solving and leadership skills that will help

them in their career. Last, a student-driven approach will help students realize that they have a voice in what happens in the classroom.

This approach is not without its limitations, however. A considerable amount of time may be necessary to implement this plan, and it may need to be revised periodically as the student body changes. In addition, some students may feel like it is not their responsibility to handle classroom disturbances or they may feel uncomfortable enforcing the plan due to peer pressure. Some faculty members may feel that a student-driven plan would take away some of their control in the classroom. However, if one considers the potential value of a plan such as this and the effects on student professional development and leadership, I would venture that the benefits outweigh the limitations for this approach.

So, how can one do this? Class officers or similar class representatives could serve as the liaison between the class body and the faculty. The officers could be given the task of meeting with the student body and developing the plan. The officers could then meet with faculty members to discuss the plan and receive faculty input. This process could continue until an agreement is made on how to handle disturbances. If they choose to, the officers could then begin the process of getting the plan adopted as a college or school policy. Once implemented, both the faculty and the students would be responsible for implementing and upholding the plan in the classroom.

Classroom disturbances have been an ever-increasing problem in our classrooms. Perhaps it's time to reevaluate our approach to handling this issue. As we examine the multitudes of ways to handle classroom disturbances, I would encourage faculty to consider using a student-driven approach to handling this problem.

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Predicting Pharmacy Students' Performance from PCAT Scores: A Further Analysis of Predictive Validity Study Data

To the Editor: In a 2006 *AJPE* article, we described a predictive validity study of the *Pharmacy College Admission Test* (PCAT), in which data were collected on 899 students from 11 pharmacy schools. Correlation, regression, discriminant, and diagnostic accuracy analyses were used to determine the validity of PCAT scores and other variables for predicting subsequent pharmacy school

grade point averages (GPAs).¹ The results of this study showed the predictive value of the PCAT scores, especially in combination with entering GPAs, and provided practical suggestions regarding optimal PCAT scores for identifying students most likely to succeed. Both PCAT scaled scores (SS) and entering cumulative GPAs showed moderate to strong predictive validity as indicators of students likely to succeed in pharmacy school.

Shortly after the completion of this study, questions from Dr. Anne Y.F. Lin of Midwestern University College of Pharmacy-Glendale about the contributions made by individual PCAT subtests to the predictive validity of the test suggested to us that further analyses were needed. As a result, a stepwise discriminant function analysis was performed, which had not been done for the original study. The purpose of the subsequent analysis was to examine the data for all 5 PCAT multiple-choice subtests in different combinations to determine how well each subtest predicted students' performance. The detailed evaluation made possible by stepwise discriminant function analysis allowed us to determine the relative value of each of the 5 PCAT subtests in predicting different levels of student performance for the first year in pharmacy school.

For the original discriminant analyses,¹ student data was divided into 2 groups according to the percentile rank (PR) of each student's GPA for each of the 4 years of pharmacy school. For those analyses, all students who had a PR of 5% or less were considered to be in the "low performance" group, and all students who had a PR greater than 5% were considered to be in the "high performance" group. Two models were used in these analyses: one that included the 5 PCAT multiple-choice subtests (weighted) plus cumulative entering GPA; and a second model that included only the PCAT subtests. The results of these analyses supported the correlation and multiple regression analyses that were also part of the original study, suggesting that PCAT scaled scores are generally valid predictors of subsequent performance.

While the original discriminant analyses were only able to suggest predictive value in a general way for the combined PCAT subtests by measuring 2 outcome variables (lowest 5% and highest 95% GPAs), the stepwise analysis conducted subsequently to the original study was able to show the predictive value in more detail by indicating the degree to which performance on each of the 5 multiple-choice subtests predicted subsequent GPA PRs. Stepwise discriminant function analysis was thus used to indicate the relative importance of each PCAT multiple-choice subtest in predicting selected first-professional year pharmacy school GPA (GPA01) PRs ranging from 1-99.

In the original study,¹ multiple regression analyses showed that the Biology (BO), Reading Comprehension (RC), and Chemistry (CM) subtests significantly contributed to the prediction of GPA01, while the Verbal Ability (VB) and Quantitative Ability (QT) subtests did not

Table 1. Stepwise Discriminant Function Analysis

GPA01 PR	PCAT Subtest				
	VB	BO	RC	QT	CM
1	1			2	
2		2		1	
3		1		2	
4		1		2	
5		1		2	
6		1		2	
7		1		2	3
8		1		2	3
9		1		2	
10		1		2	
15		2	3		1
20	4	3	2		1
25	4	3	2		1
30		3	2	4	1
35		3	2		1
40		2	3		1
45		2	3		1
50		3	2		1
55		3	2		1
60		3	2		1
65		3	2		1
70		3	2	4	1
75		3	2		1
80		3	2		1
85		3	2		1
90	2	4	3		1
91	2	4	3		1
92	2		3		1
93	2	3	4		1
94			2		1
95	3		2		1
96		3	2		1
97	2				1
98	2				1
99	2				1

GPA01 PR = percentile rank (PR) group of first-year pharmacy school grade point average (GPA01); VB = Verbal Ability; BO = Biology; RC = Reading Comprehension; QT = Quantitative Ability; CM = Chemistry. For each GPA01 PR group, the numbers in a row (1, 2, 3, or 4) under the PCAT subtest headings represent the relative degree of contribution for each subtest in predicting that a student will fall within the corresponding GPA01 PR group: 1 = most significant contributor to predicting indicated GPA01 PR; 2 = next most significant contributor; 3 and 4 = minor contributors (in order); blank = no significant contribution

contribute significantly. These results were consistent with the correlation analyses and discriminant analyses conducted for the same study. While these findings are generally accurate, the more detailed findings made possible by stepwise discriminant function analysis showed that both the VB and QT subtests were indeed useful in predicting various subsequent GPA01 PRs.

Table 1 presents the results of the stepwise discriminant function analysis and shows the 5 multiple-choice subtests and the order in which each one begins to significantly predict performance. For this analysis, the number (1, 2, 3, or 4) indicates the degree to which a variable (a PCAT subtest score) contributes to predicting an outcome (a GPA01 PR), with 1 and 2 indicating the most significant contributions (in order of significance) and 3 and 4 indicating contributions of lesser significance. For example, for a GPA01 PR of 25 (the percentile rank for students' GPA in the first year of pharmacy school), the subtest to most significantly predict this performance was CM (1) followed by RC (2), with BO (3), and VB (4) contributing minimally, and QT not significantly involved.

As shown in Table 1, different subtest combinations were more involved in predicting different GPA01 PR groups. In general, the BO and QT subtests combined to best predict students in the lower GPA01 PR groups ($\leq 10\%$), with CM also contributing to the 7-8 PR groups, and VB rather than BO contributing to the lowest 1 PR group; the CM, RC, and BO subtests combined to best predict students in the middle GPA01 PR group (15%-85%), with VB also contributing to the 20 and 25 PR groups, and QT to the 30 and 70 PR groups; and the CM, VB, RC, and BO subtests combined to best predict group members within the higher GPA01 PR group (90%-96%), with CM and VB best predicting for the very highest 97-99 PR group.

In summary, when student data were grouped by the PR of GPA01 and a stepwise discriminant function analysis was used, all 5 PCAT multiple-choice subtests were seen to predict first-year pharmacy GPA percentile rank groups, with different subtests having more or less predictive value for different groups. In general, the PCAT Biology and Quantitative Ability scores were most predictive of students likely to earn the lowest GPAs in pharmacy school ($\leq 10\%$ GPA01 PR); the Chemistry, Reading Comprehension, and Biology scores were most predictive of students likely to earn the middle GPAs in pharmacy school (15%-85% GPA01 PR); and the Chemistry, Verbal Ability, and Reading Comprehension scores were most predictive of students likely to earn the highest GPAs in pharmacy school ($\geq 90\%$ GPA01 PR). Thus, all 5 PCAT multiple-choice subtests play significant roles to varying degrees in predicting subsequent first-professional year pharmacy school GPAs at different levels.

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REFERENCES

1. Meagher DG, Lin A, Stellato, CP. A predictive validity study of the Pharmacy College Admission Test. *Am J of Pharm Educ.* 2006;70(3):Article 53.