JOIN THE CONVERSATION:
Are Students' Behaviors in College Classes Conditioned by their Experiences in High School?

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This research follows a previous study published in The Learning Assistance Review, Moore (2006a), that reported developmental education students are exceedingly confident of their academic abilities, despite the fact that most of them will not graduate from college.

Abstract

Students in an introductory college biology course who believed that attending class had been important for their academic success in high school were 1) most likely to attend their college biology class, 2) most likely to earn high grades in their college biology class, 3) most likely to report that their high school classes had been challenging, and 4) were least likely to base their attendance on whether they received points for attending class in college. College science teachers can use assessments of students' first-day-of-class attitudes about class attendance to identify and design interventions for students most likely to earn low grades.

College science teachers have a variety of attitudes and policies about class attendance. As Druger (2003) has noted, "Some instructors don't care if students attend class at all . . . [whereas] other instructors feel strongly about the importance of class attendance. Some instructors check attendance at every class; others don't check it at all" (p. 350). Regardless of their policies, college science teachers know that attendance is important because it is the most obvious and important indicator of students' levels of academic engagement. Indeed, class attendance in introductory science courses is strongly correlated with grades (Launius, 1997; Moore, 2003a;

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Wiley, 1992). As Thomas and Higbee (2000) have noted, "The best . . . teacher, no matter how intellectually stimulating, no matter how clear in providing explanations and examples, may not be able to reach the high-risk freshman who has no real interest in learning … and will certainly not be successful with the student who fails to show up for class" (p. 231).

Many students understand that class attendance is associated with good grades (Moore, 2003a). Nevertheless, and despite teachers' warnings (e.g., "It's important for you to prepare for and attend class"), many students skip lectures, labs, help-sessions, and other course-related opportunities (Moore, 2006b). Not surprisingly, and regardless of their high school grades and ACT scores, students who skip class and ignore course-related opportunities are much more likely to earn lower grades in introductory college science courses than are students who attend class and participate in course-related activities (Moore, 2004). As Thomas and Higbee (2000) have noted, "Nothing replaces being present in class" (p. 229).

Although college students are responsible for their behaviors, we wondered to what extent, if any, students' academic behaviors in college science classes are conditioned by their experiences in high school. Many reports have lamented the poor study-habits of high school students (Honan, 1998; Marklein, 2006; Young, 2002), and absenteeism is especially high (e.g., 25% to 50%) in introductory college science courses, even in those taught by award-winning instructors (Friedman, Rodriguez, & McComb, 2002; McGuire, 2003; Thompson, 2002). Romer (1993), who notes that absenteeism in introductory college courses is "rampant," describes the situation this way: "A generation ago, both in principle and in practice, attendance at class was not optional. Today, often in principle and almost always in practice, it is" (p. 174). Given the close association of class attendance and academic outcomes, it is not surprising that grades in introductory science courses are also especially low (Congas, Langsam, & Schoeps, 1997). Why don't more college students attend their introductory science classes? When students enroll in college science courses, do they believe that coming to class is important?

In a previous study published in The Learning Assistance Review, Moore (2006a) reported that developmental education students are exceedingly confident of their academic abilities, despite the fact that most of them will not graduate from the college. In the research reported here, we have extended these earlier studies by addressing several additional questions. For example, do students believe that going to class was important for their success in high school? Do students base their attitudes about the importance of class attendance in college on their attitudes about the importance of class attendance in high school? If so, how do those attitudes about class attendance translate into students' actual patterns of attendance? How do students' views of the importance of class attendance in college relate to their grades and rates of attendance in college science courses?

Methods

Site of the study and its students

This study included 1,837 students enrolled in a traditional introductory "mixed majors" biology course offered at a large research university in the Midwest. We used short in-class writing assignments to record attendance at every class, and on the first day of class (as well as in the course syllabus) students were shown data emphasizing the correlation of attendance and grades in the course (Moore, 2006a, 2006b). However, students received no points for attending class.

The course was taught by professors using similar grading criteria and the same syllabus, textbook, classroom, and pedagogical styles. Students in the study had an average ACT composite score of 20 (for comparison, the national average is 21), an average high school rank of 57%, an average age of 20, and a gender-distribution of 49% female and 51% male. These students' ethnic diversity was as follows: 17% African American, 2% American Indian, 16% Asian American, 4% Chicano/Latina, 58% Caucasian, and 3% Other. Students came from a diverse array of high schools, most of which were in the Midwest. We excluded 23 students who failed the courses because of academic misconduct (cheating and plagiarism).

Students' interests, GPAs and graduation rates

We used institutional records to obtain students' grades in high school biology. We calculated GPAs by awarding four points for an A, three points for a B, two points for a C, one point for a D, and no points for an F.

Students' attitudes and expectations

At the beginning of the first day of class in college, we distributed a survey asking students to respond to the questions listed in Tables 1 and 2. At the final exam, we distributed another survey asking students this question: "If I could repeat this course, I would attend class (a) more often, (b) less often, or (c) about the same amount." Students' responses were tallied after final grades were submitted, at which time students' responses were grouped according to students' grades in the introductory biology course.

Results

Students' responses to questions about their grades and attitudes regarding class attendance in high school are presented in Table 1. Students' responses to questions about their grades and attitudes regarding class attendance in their college introductory biology class are presented in Table 2. Numbers in the tables are percentages of students who agreed with each statement. Students' grades in their high school biology courses were as follows: A = 33%, B = 58%, C = 9%, D = 0%, and F = 0%.

Table 1

How students' attitudes about attendance and grades in high school are associated with their grades in an introductory biology course in college. Numbers in the table are percentages of students who agreed with each statement.

	Grade in Biology Course				
	A	B	C	D	F
In high school, it was important to attend class.	82	71	72	59	56
In high school, I got points for attending class.	59	54	58	59	57
High school challenged me; I had to work hard.	59	42	41	44	44
In high school I attended					
90-100% of my classes	85	85	86	92	89
80-90% of my classes	9	11	8	5	8
70-80% of my classes	6	4	6	3	3
High school prepared me well for college	80	80	77	76	77

N = 1837

Table 2

How students' attitudes about attendance and their grades in high school are associated with their grades in an introductory biology course. Numbers in the table are percentages of students who agreed with each statement.

	Grade in Biology Course				
	A	B	C	D	F
I'll come to class more often if I get points for attendance	59	76	74	84	83
If I could repeat this course, I would attend class					
More often	9	18	30	68	50
Less often	1	2	2	3	8
About the same	90	80	68	29	42

On the first day of class, more than half (i.e., 51%) of students predicted that they would earn an A in the introductory college biology course, 44% predicted that they would earn a B, and 5% predicted that they would earn a C. No students predicted they would earn a D or F.

Students' grades in the introductory biology course were as follows: A = 10%, B = 27%, C = 31%, and D/F = 32%. The average attendance rates of students who earned various grades in the college biology course were as follows: A = 92%, B = 79%, C = 70%, D = 61%, and F = 34%.

Discussion

In this study, students' grades in introductory biology were not influenced by students' attitudes about their preparation for college. Indeed, and regardless of their grade in the introductory biology course, large majorities (i.e., 76-80%) of students believed that high school had prepared them well for the academic challenges of college (Table 1). Students had good reason to believe this; after all, more than 90% of the students in this study had earned an A or B in their high school biology course, and none of the 1,837 students in this study— despite the fact that they were "at risk" students unlikely to graduate from college (Moore, 2007)—had earned a D or F in their high school biology class. These results are consistent with the claim that students enter our introductory courses confident that they will earn high grades (Moore, 2003a), and indicate that differences in students' grades and behaviors in the introductory biology course in this study were not due to students' differing views of their academic preparation from high school.

Most students reported that they had received points for attending class in high school (Table 1). This percentage was similar (i.e., near 60%) regardless of the grades students earned in the college biology course. These results indicate that the differing attendance rates of students who earned different grades in the introductory biology course were not attributable to the conditioning that could have resulted from differential rates of receiving points for attending class in high school.

On the first day of class, large majorities of students believed that the most important factor for their success in the college biology course was their effort, not luck, their aptitude, or the difficulty of the course (Moore, 2006a, 2006b). These majorities were similar regardless of students' final grades in the college biology course. These results indicate that, regardless of their eventual grade in the course, students believe from the outset of classes that their effort is the most important determinant of their success (Table 1). This belief is well founded; students' effort is strongly correlated with their success or failure in introductory college biology courses (Moore, 2006a, 2006b, 2007). These results are also consistent with the finding that students who predict that they will earn high grades in introductory biology courses attend more classes than students who predict they'll earn low grades (Moore, 2003a).

As has been noted by Launius (1997), many students' rates of class attendance are based on whether they receive points for attending class (Table 2). On the first day of classes, these students acknowledge that they will attend class more if they receive points for coming to class and will attend class less often if they do not receive points for attendance. In this study (i.e., in which students received no points for coming to class), students followed through on their first-day-of-class claims; on average, students who attended the fewest classes were those who claimed that their rates of class attendance would be based on whether they received points for coming to class (Table 2). Similarly, the highest rates of class attendance characterized students who claimed that they were not influenced by

whether they received points for coming to class. These results indicate that in courses in which students get no points for attending class, students' linkage of class attendance with receiving points is an accurate predictor of students' actual rates of class attendance. This is important because most introductory science courses do not award points for merely coming to class (Davis, 1993).

Students' linkage of class attendance with points-for-attendance is also associated with students' grades. For example, students whose rates of class attendance were not influenced by whether they got points for attendance earned disproportionately higher percentages of the highest grades in the course, and students whose attendance was predicated on receiving points for showing up earned disproportionately higher percentages of the lowest grades in the course (Table 2). These results indicate that students' first-day-of-class attitudes about class attendance can be used to predict students' rates of class attendance as well as their grades in introductory biology courses. Science instructors should consider using assessments of students' attitudes about class attendance as a basis for identifying (and designing interventions for) students whose academic behaviors are most likely to produce academic problems. For example, emphasizing the relationship of class attendance and course grades improves the attendance and grades of some students (Moore, 2003a). However, this emphasis must be done repeatedly and be based on quantitative data; truism such as "it's important for you to attend class" presented only on the first day of class have little impact (Moore, 2003a).

So what determines students' attitudes about the importance of attending class? In high school, class attendance is often important; students who earn the lowest grades skip or are tardy for many more classes than students who earn the highest grades (Peterson & Colangelo, 1996). In the study reported here, students most likely to recognize the importance of attending class in high school were also most likely to claim that they had worked hard in high school. For example, students who earned an A in the introductory biology course were 1.3-times more likely to claim that they had worked hard in high school than were students who earned an F in the college biology course (Table 1). Students most likely to claim that it was important to attend class in high school were also more likely to attend class in college and make an A in the introductory biology course. For example, students who earned an A in the biology course were 1.45-times more likely to believe that coming to class is important than were students who earned an F in the biology course. These results support the claim that students who graduate from high schools having high standards have a decided advantage in college (Cohen, 2006; Rumberger, 2001), for the rigor and "academic intensity" of high school courses are the most important pre-college factors associated with collegiate success (Hoover, 2006, p. A37). Similarly, schools having low standards that do not challenge students – Belfanz and Legters (2006) refer to them as "dropout factories" (p. 41) — put their students at a distinct disadvantage in college (Bridgeland, Dilulio, & Morison, 2006; Olson, 2006a, 2006b).

Further Study

Although some at-risk students have academic behaviors that predestine them to academic failure (Moore, 2007), the research presented here raises

several questions for future research that could minimize this problem. For example, would students' rates of class attendance improve if they were periodically sent reports documenting their grades and attendance rates? Would attendance improve if students were forced to explicitly acknowledge their absences (e.g., by writing a short essay about their grades and attendance rates)? These and related questions may help instructors and learning assistance professionals better understand one of our most vexing problems—namely, why students most needing academic help are often so unwilling to engage themselves in their educations. (Moore, 2006b).

Conclusion

At the end of the semester, students who earned the lowest grades in the college biology course were much more likely to wish that they had attended class more often than were students who earned high grades in the course. For example, students who earned Ds and Fs were approximately seven-times more likely to wish that they had attended class more often than were students who earned an A in the course. These results 1) are consistent with the fact that students understand that their effort (and not factors such as luck or aptitude) is the most important determinant of their grades in college science courses (Moore, 2006a, 2006b, 2007), and 2) support the finding that course engagement — and specifically, class attendance —is critical to students' success in introductory biology courses (Moore, 2003a, 2003b). As Thompson (2002) has noted, "If a student ever complains about a grade or how tough the course is, one of the first things I look at is class attendance. That usually says it all" (p. B5).

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