Motivational Correlates of Academic Success in an Educational Psychology Course

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Abstract

The variables of class attendance and the institution-wide Early Alert Grading System were employed to predict academic success at the end of the semester. Classroom attendance was found to be statistically and significantly related to final average and accounted for 14-16% of the variance in academic performance. Class attendance was found to decline over the semester. The new system of Early Alerts that warned students earning the grade of 2.0 and below during the 6th week of the semester was found to only marginally improve the prediction of at-risk students. A public method of sharing Exam #1 to Exam #2 improvement with the entire class is also presented as a reinforcement tool that protects the name of individual students. The implications of such research on teaching for instructor and student decision making and institutional policy decisions are also discussed in the report.

Motivational Correlates of Academic Success in an Educational Psychology Course

Course instructors in the field of psychology frequently attempt to integrate what we know about research, research-based decision making, and theory into the college classroom. Such research is often called pedagogical research or research on teaching. Shulman (2003) at the Carnegie Foundation for the Advancement of Teaching has called this the "scholarship of teaching and learning." The SOTL or SoTL (Scholarship of Teaching and Learning) movement as an inter-disciplinary and prevailing trend in higher education seeks to make college/university teaching more reflective, effective, and transparent through the public sharing of research findings and successful classroom contextual interventions. The following research report adheres to such a philosophical and pragmatic trend.

It seems reasonable to conclude that attending class might be one motivational variable often largely under the control of each student and of considerable interest to instructors and students alike. A quick data-base search in PsycINFO was launched with the following three descriptors: class attendance, grades, and psychology classes. A total of 143 results were generated and the earliest reference (Turner, 1927) dated back to 1927! Apparently, this is a topic that has been of considerable interest to researchers for over 8 decades.

Unfortunately, attendance was often only one of several predictor variables employed in research studies in order to ferret out the complex relationships that exist between class attendance and intellectual ability, motivation, study strategies, gender differences, etc. Many variables are thought to be related to academic success. Class attendance is an observable and public variable that obscures the actual motives and intentions behind such a behavioral action.

For example, one's presence in class could be driven by a sense of obligation and responsibility, avoidance of guilt for missing class, intrinsic desire to learn, social factors, or the hope that something mentioned in class will be on the next exam.

The fact that researchers have sought to explore this topic in other fields of study and courses such as biology (Moore, 2003), remedial mathematics (Berenson, Carter, & Norwood, 1992), Japanese culture (Gump, 2005), medical school (Hyde & Flournoy, 1986), and economics (Brocato, 1989) reminds us that the relationship between class attendance and academic success is of interest across the entire college campus. Psychological researchers might have a slight advantage in such research on teaching in that they often possess research skills and are familiar with theoretical models that have emerged from their own discipline to apply to the college classroom. An inference from such a circumstance is the implication that teachers of psychology should be leading the way in such research frontiers.

Nearly all psychology instructors and even most psychology students can spot that motivational theories and the accompanying research associated with such theoretical perspectives are explicitly relevant to student success or failure in a class. This is certainly true of my personal insights, since while doing doctoral work at the University of Michigan in the 1980's I had the privilege to study under the tutelage of such notable professors as John (Jack) Atkinson, Bill McKeachie, Jacquelynne Eccles, Allan Wigfield, and many others. While attending a "Festschrift for Jack Atkinson" on the U. of M. campus in 1985, I had the privilege to meet David McClelland, Norman Feather, Bernard Weiner, Nathan Brody, David Birch, Willy Lens, Virginia Blankenship, and others. During the Winter Semester of 1987, I even had the chance to take a semester-long course on attribution theory with Bernard Weiner on the Ann Arbor campus (he was on sabbatical leave from UCLA at this time).

Needless to say, these ideas, research findings, and theoretical models became the backbone of my dissertation and the focus of my career. My teaching has led me to constantly be on the alert for how I could better motivate students in the direction of higher achievement and create an improved learning environment to foster learning. The inference of such work also means that I have adopted the teaching mission of helping those students who suffer from test/performance anxiety and fear of failure so that they can reach their true academic potential.

The research literature is filled with studies that explore student attendance and the rules/reward systems for class attendance, student explanations regarding why they attend class, if students believe attendance should be mandatory, and a description of the diverse classroom settings that might promote or reduce student attendance. The findings are mixed when it comes to the central issue of the relationship between college class attendance and academic performance or grades. Most studies have found that attendance is positively related to class performance, but the collective power of student presence in the classroom to predict academic success varies widely. For example, Van Blerkom (2001) reported correlations between class attendance and course grades as ranging from .29 to .73. A few studies have even found that high classroom attendance is not linked to good grades (Berenson, et. al., 1992).

The following research report offers a detailed examination of course attendance and Early Alert Grade policies as predictors of success at the end of the semester. A method of recognizing student improvement from Exam #1 to Exam #2 was also designed in order to find a pedagogically-sound method of publically rewarding such student achievement gains. The working hypothesis was that attendance would be positively correlated to end of the semester average at statistically significant levels.

Method

Subjects

Data collection was completed during the Spring and Fall Semesters of 2010 in a total of seven different intact sections of the research investigator's own Educational Psychology course. The course offering was at a relatively small rural campus of the New York State university system with a total undergraduate and graduate population just under 4,500 students. Approximately 80% of the students in the classes were female. Nearly all students were juniors or seniors and most took the course because it was required in their elementary/secondary teacher preparation program. IRB approval was obtained at the institutional level in order to collect data and conduct this research project.

Measurement Instruments

Although student motivation in a course could be operationally defined and measured in many different ways, class attendance is a broad over-arching variable that is at least some indication of the student desire to be present during regular classroom sessions. Unfortunately, such a variable also fails to indicate the cognitive or affective level of learner involvement and the distractibility of learners during such a class session. On the missing side of the attendance ledger, students who had legitimate absences due to accidents, injuries, or emergencies are not segregated from the students who purposefully are cutting class, oversleeping, or leaving campus early for break. Nevertheless, class attendance in the present study was an easily recordable variable and a highly accurate measure of this complex variable. Each student documented his/her full signature on the first day of the class and every student signed-in at each future session in order to record his/her attendance. In this manner, the instructor recording attendance could rather easily detect any forgery and the Institutional Honor Code was referenced in the

course syllabus to ward off such inappropriate behavior. The possibility of students arriving late or leaving class early was not measured as a variable in this study.

Several intervening variables were present in this research milieu. The course was structured with many supplementary learning tools such as chapter organizers that highlighted all the content in the text to be covered on the exams and a total of 315 practice multiple-choice exam items with answers and explanations of the answers. These two course documents were required for the class and purchased at the campus bookstore. Blackboard (a web-based course management system on campus) was also employed during the semester and a total of 40-50 folders with learning handouts were made available to students over the course of the semester. These study/learning tools made it possible for students to learn the course content outside of class and for a few students might have functioned as an attendance inhibitor.

Several years ago, I chose to institute an attendance requirement whereby students needed to attend at least 70% of the regular class sessions in order to earn the final grade of 2.0 or above. This means that variance in class attendance rates will be considerably less in this study than in a class setting where no attendance policy exists and there is no penalty for missing a large number of classes. Such a 70% policy was in place during this entire study and students who passed the course requirements, but did not meet the 70% attendance policy due to illness, hospitalization, or personal issues could petition the instructor for an exception to this policy with documentation of the circumstance from an objective third party (doctor, campus counselor, minister, rabbi, employer, etc.). Such exceptions were extremely rare each semester.

A new institutional policy for instructors reporting Early Alert Grades at the end of the sixth-week of the 15-week semester was approved by the Faculty Senate and permanently changed during the second semester of the study. This prompted a research exploration of the

new policy within my own teaching/learning context. The new policy extended Early Alert Grades to those students who at this 6-week point of the semester where functioning at a 2.0 or "C" level **and** below when the previous policy included **only** those students with a current grade **under** a 2.0. The current concern over retention rates on my campus and the desire to motivate students to do their very best work likely prompted this change in policy. Since such over-identification of students in terms of the assigning of Early Alert Grades involves minimal risk (e.g., such Early Alert information does **NOT** become part of the student's permanent academic record), this new procedure was explored in order to judge the effectiveness of such policies to identify at-risk students.

Of particular interest to this researcher was the question: How many more students identified through this New Early Alert System would actually fail the class? This is a motivational topic, since the Early Alert System is an attempt to warn students and others on campus (athletic coaches, special program directors, academic advisors, etc.) regarding at-risk students needing some form of intervention that ideally would lead to student academic success.

Results and Discussion

Class attendance, as measured by the percentage of classes attended out the total possible sessions available, was found to be positively and statistically significantly related to the end of course average ($r = .40$ ** $p < .01$; $n = 97$) and ($r = .38$** $p < .01$; $n = 120$). Such outcomes closely match the previous findings in the same course where attendance was also found to be correlated with end of class average ($r = .44$**; $n = 98$) (see Herman, 2009). Approximately 14-16% of variance in end-of-semester class averages could be explained by the percentage of classes attended during the semester.

How do such findings compare with other studies in psychology courses that employed a correlational comparison? Launius (1997) reported significant positive correlations ranging from .24 - .40 for attendance and objective exams during the course, but the correlations of class attendance to the comprehensive, objective final exam was only found to be significant (r=.36) in one out of four 200+ subjects samples. Gunn (1993) informed students in a first-year psychology course that attendance would be taken, but such attendance would not be a factor in their grades and found a significant correlation (r=.66). Van Blerkom (2001) reported significant correlations between attendance and grades for 17 undergraduate sections of psychology ranged from .29 to .73 (Mdn=.55).

A Pedagogical Model of Reporting Exam Improvement

Course instructors frequently search for ways to reward and publically recognize high achievement on exams and other coursework. It is hoped that such students could become positive role models for lower-achieving students. The modeling process could inspire motivation with the goal of improved achievement. In this particular research context, the goal was to discover a method of rewarding and recognizing individual improvement on Exam #2 as compared to Exam #1. Each exam consisted of 75 multiple-choice items with four possible options and covered different chapters in the textbook. The public identification of such achievement progress by name was ruled out of consideration by the course instructor. This was done even though most of the predominately New York State population of students in this college classroom could readily recall teachers publicly reading achieved scores aloud with names in their high school classrooms (the student option to pass on this public sharing was usually present). This approach was ruled out in the college classroom for privacy reasons and in case a shy student in class might suffer embarrassment or other social stigma.

The pedagogical approach adopted here was primarily descriptive and simply reported the student improvement scores (without names) by how many more questions on Exam #2 were correctly answered as compared to Exam #1 for individual students. In this manner, each student would privately know if their "improvement score" was indicated on the board as a dramatic improvement from Exam #1 to Exam #2.

The following summary of the descriptive results from Table 1 were shared with students in class during the Fall Semester. Overall class results indicated that approximately 62% of the scores improved at least some from Exam #1 to Exam #2, 7% indicated no change (they received the identical score), and 31% actually decreased. Table 2 portrays such exam improvement on a more individual level. Dramatic improvement was operationally defined as "a more than a chance" improvement score of 8 or more items out of the 75 item multiple-choice exam. The most exemplary students showed improvement of 26, 22, 20, 18, 17, 16, and 15 items on Exam #2 as compared to Exam #1. A total of 31 students (27% of the total number of students who took the exam) demonstrated improvement on Exam #2 between 8 and 26 items. 71% of such students had received Early Alert Grades (2.0 or lower average) at the end of the 6th week. Tables 1 and 2 also depict similar results for students during the Spring Semester. As a pedagogical reminder, simplified versions of Tables 2 and 3 were presented to students in class in order to promote the best use of class time and to maintain the anonymity of the student scores and personal circumstances.

A more statistical approach seemed warranted by the course instructor based upon the following concern: At what point might such increases in scores from Exam #1 to Exam #2 be related to chance rather than actual improvement? For each participant, the proportion of correct answers on the first exam was used to calculate the Binomial probability of receiving the number

of correct answers achieved on the second exam. For example, imagine a participant scored 45 on the first exam, 45/75 = 0.6. If that participant's second exam score was 55, the probability that he or she would score 55 or higher on the second exam—assuming that the expected proportion of correct answers remained 0.6—is 0.01. It was decided that improvement change values where $p<.05$ would be used in order to rule out the situation in which an individual's measured knowledge (exam score) did not really change and an increased second exam score could have occurred by chance. All 31 students mentioned in the previous paragraph met this statistical test, thus such improvement was judged to be unlikely to have occurred due to chance.

The literature reports a philosophical and pragmatic gap amongst professors and students with respect to how class attendance should be rewarded in the classroom. Bebeau, Eubanks, and Sullivan (1977) reported that the favorite student preference for general incentives in class (including attendance) was being "released from taking the final examination" and second favorite involved "earning points toward the course grade." In only a somewhat different vein, Sleigh, Ritzer, and Casey (2002) found that students offered more different acceptable reasons for missing class than faculty members and reported greater interest in class if the material covered was included on the exam. Professors, in contrast to students, in this 2002 study believed that interest level in the content would most powerfully motivate student to attend class.

Table 3 examines the aggregate attendance patterns for the same course over two different semesters. As mentioned in the notes section below the Table and as anticipated, attendance was nearly perfect (99-100%) on exam dates. A visual inspection of the tables indicates a high percentage of student attendance at the start of each semester followed by a measureable decline particularly in the last third of the semester. Low points in average attendance were often explained by unusually pleasant spring weather, dates immediately before

or after campus-wide scheduled breaks in the semester, and immediately after a major exam. The phenomenon of student attendance in class dipping on the next class following a major exam is believed to be an artifact of Grade Center on Blackboard where students can obtain access to their scores on the exam before attending the next class. Prior to the use of such technology, students had to come to the next class session after an exam in order to obtain such exam performance information.

Since student attendance on exam days was required based upon course requirements mentioned in the syllabus, these 6 exam-day entries were deleted from the data set and the correlation between the remaining sequential order of classes and the percentage of students present at each session was calculated. The logical deletion of exam dates meant that the chronological sequence of class sessions variable moved from an interval to ordinal scale. For this reason, Spearman's rho was employed to analyze this data set. The correlations were found to be statistically significant at rho=-.65** for the Fall Semester and rho=-.55** for the Spring Semester. This can be interpreted as empirical support for the visual observation that as the semester progressed─ attendance declined. Such results compares favorably with Van Blerkom (1990, 2001) who also found that student attendance declined from the beginning to the end of the semester.

This phenomenon might be explained in the current research study by the assumption that several factors related to the structure of the course and existing attendance requirements. All students had to meet the "70% attendance" rule as previously outlined in the Method Section. Successful students in the class who attended regularly in the first two-thirds of the semester might have been confident that their success would continue and believed that they could "afford" to skip or miss classes later in this semester within the 30% of total classes allowed to

miss without explanation or documentation. The extensive study/learning tools available through Blackboard and other venues mentioned in the Method Section could have mitigated missing class for these students. Students who were struggling in the class might have known that they were unlikely to pass the class with a 2.0 or higher and therefore they were not very concerned about missing classes later in the semester or meeting the "70% attendance" rule.

Table 1 also depicts a descriptive comparison of the Old and New Early Alert Systems. The Old System that identified students at the 6th week in the semester functioning "below the grade of 2.0" was compared to the newer system that also included students functioning "at or below the current grade of 2.0." The New Early Alert System over two semesters had the potential to identify 29 additional students thought to be in academic jeopardy and not identified by the Old System. Only 3 of such 29 students (10%) eventually did not earn a final grade of 2.0 or above in the class. As mentioned in the Method Section, the over-identification of students thought to be at academic risk is often perceived by faculty members and administrators to be a worthwhile venture. It is hoped that such early identification of students in academic jeopardy might motivate students to contact their course instructor, seek tutoring and advising, and modify their existing study/learning patterns that might result in higher grades and at the institutional level lead to improved retention. The case can also be made for the possibility that the New Early Alert System might have motivated students to not only pass the class but also achieve a higher score than would have been the case under the old system.

Educational Implications

The results reported here supported the following pedagogical decisions in the college classroom:

1) Students should be told at the start of the semester that class attendance is related to class performance, if the instructor can provide evidence that this is true. The overall trend tells us that: Attending class makes a positive difference and is associated with greater chance of success in the class. Obviously, there are many other variables that would help to predict academic success in the college classroom such as intelligence, study skills, test-taking skills, achievement motivation, self-efficacy, reduction of test anxiety, etc. What makes class attendance especially important is that in most cases (with the exceptions such as illness, hospitalization, and other emergency conditions) this variable is directly under the volitional control of each student.

2) The New Early Alert Policy only identified 3 students out of 29 additional students that were functioning at the 2.0 level during the 6th week of the semester that failed to eventually earn the final grade of 2.0 or higher. The minimal potential harm done by such over-identification of students at risk resulted in the continuation of this policy. Only future research will be able to determine the effectiveness of the New Early Alert Policy campus-wide policy, since different findings might be detectable in other courses on campus.

3) The "Improvement Score" policy was continued as a pedagogical tool for recognizing substantial improvement on class examinations in a public manner that also protected the anonymity of the students involved. Since the correlation from Exam #1 to Exam #2 was r=.82, these 31 students (27% of the total class) in the Fall of 2010 defied the statistical odds of reliability that their Exam #2 scores would likely be very similar to their scores on Exam #1. Unfortunately, many students who improved dramatically on Exam #2 were unable to sustain this level of achievement and at the end of the semester received a final grade less than a 2.0.

4) Each course instructor should be curious regarding how attendance operates in his/her specific class or classes. The existing research results in the literature across different

disciplines/programs and course designs are a poor guide to how attendance operates as a motivational tool in specific classes. The fact that research on intact classes is fairly easy to conduct (assuming attendance records are kept) makes this an attractive method of understanding one's own teaching and student behavior in the college classroom.

5) If an instructor cannot document that attendance is related to success in the course at or above statistically significant levels, it behooves the instructor to re-evaluate his/her course attendance policy. Verbeeten (2006) documented that mandatory attendance policies are unpopular with students, could cause some student resentment, and will be more effective if instructors explain the rationale, relevance, and usefulness of attendance as a motivational factor in the classroom.

Summary

It seems obvious to conclude that college class attendance is a variable, that while highly measureable and largely under the control of students, camouflages other more hidden variables that might in the long-run be considered even more important for learning. Readers are explicitly reminded that correlational research does not imply causality, but rather only describes the associative relationship between variables. If class attendance and academic performance was zero-ordered and not statistically significant, we should more carefully examine such attendance policies with a focus upon a rationale and justification for such a practice. St. Clair (1999) makes the important case against compulsory college class attendance policies by suggesting a re-focusing upon grading based solely upon course achievement and adds that "by making attendance compulsory, administrators and faculty are accepting more responsibility for the academic achievement of students than can be justified" (p. 180).

This study supports the time-honored role of research-based teaching as a useful tool for supporting excellence in teaching, motivating student learning, and judging the effectiveness of instructor decisions as well as institutional policies. The author hopes that such pedagogical research might promote and inspire future research in other college/university classrooms. Sharing such results in public forums is essential to the advancement of college teaching and the improvement of student learning. Our students deserve the finest instruction and learning climate we can offer as we continue to search for methods to motivate students toward high academic achievement.

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Table 1 A Comparison of Student Scores on Exam #1 and Exam #2

Change/No Change from Exam #1 to Exam #2 **Fall Semester 2010**	Change/No Change from Exam #1 to Exam #2 **Spring Semester 2010**
Improvement: 72/116 = 62% No Change: 8/116 = 7% Decrease: 36/116 = 31%	Improvement: 69/100 = 69% No Change: 5/100 = 5% Decrease: 26 /100 = 26%

Spring 2010	N=?	Percentage	Average Change in Items	S.D.	*Old Alert System* (Final Grade below 2.0)	*New Alert Additional Students* (Final Grade below 2.0)
Increase	N=69	69%	+ 7.29	5.79	N=32 (N=22)	N=7 (N=1)
Same Score	N=5	5%	-------	------	N=0 (N=0)	N=1 (N=0)
Decrease	N=26	26%	- 3.85	3.56	N=8 (N=7) Failures=29	N=0 (N=0) Failures=1

Fall 2010	N=?	Percentage	Average Change in Items	S.D.	*Old Alert System* (Final Grade below 2.0)	*New Alert Additional Students* (Final Grade below 2.0)
Increase	N=72	62%	+ 7.37	5.53	N=35 (N=16)	N=8 (N=1)
Same Score	N=8	7%	-------	------	N=2 (N=2)	N=2 (N=1)
Decrease	N=36	31%	- 4.68	3.60	N=8 (N=6) Failures=24	N=11 (N=0) Failures=2

Table 2 Exam #1→Exam# 2 Student Improvement

More items correct on Exam #2 as compared to Exam #1 (Fall 2010)	More items correct on Exam #2 as compared to Exam #1 (Spring 2010)
26 ***(57%)**	26 ***(48%)**
22 ***(53%)**	22 ***(51%) *(61%)**
20 ***(63%)**	21 ***(63%)**
18 ***(55%) *(56%)**	20 ***(50%)**
17 ***(63%)**	17 *(70%) ***(57%)**
16 ***(61%)**	16 ***(61%)**
15 ***(69%)**	15 ***(44%)**
13 ***(60%) *(66%)**	13 *(74%)
12 ***(62%)** *(72%) ***(68%)**	12 *(74%)
11 *(78%) *(80%) ***(61%) *(63%)** *(85%)	11 ***(59%) *(56%)**
10 *(75%) *(81%) ***(61%)** *(72%)	10 *(77%) ***(53%) *(51%)** *(76%)
9 ***(66%) *(48%) *(63%)**	9 ***(63%) *(59%)** *(74%)
8 ***(62%)** *(82%) ***(68%) *(55%) *(58%) *** (83%)	8 *(80%) ***(54%) *(67%)** *(80%) ***(66%)**
Total: N=31 Students	Total: N=25 Students
Bold Entries: 22/31 = 71% Received Early Alerts **All percentages indicate average prior to Exam #2**	**Bold Entries: 17/25 = 68% Received Early Alerts** **All percentages indicate average prior to Exam #2**

Table 3 Aggregate Attendance Patterns over an Entire Semester

Percentage of Students Attending Classes during the Spring Semester of 2010

Chronological Class Sessions from 1st to 29th Class Meetings during the Spring Semester of 2010

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
97	96	92	92	89	73	100	81	83	85	79	75	87	100	81	81	82	83	84	100	74	70	87	100	74	58	85	100	99

Percentage of Students Attending Classes during the Fall Semester of 2010

Chronological Class Sessions from 1st to 29th Class Meetings during the Fall Semester of 2010

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
98	94	96	92	91	92	100	81	77	77	84	75	99	77	80	87	82	87	77	100	76	74	80	67	82	100	78	99	100

Notes:

Spring Semester Exam Dates fell on the 7th, 14th, 20th, 24th, 28th, and 29th Class Sessions

Fall Semester Exam Dates fell on the 7th, 13th, 20th, 26th, 28th, and 29th Class Sessions