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Variations of Grading in College Science Courses

Abstract

This study concludes that levels of achievement and the rigor of grading in pre-professional science courses vary significantly among some colleges and universities.

Many comparative studies of achievements in the high schools have been possible because the admissions procedures of most colleges and universities require the results of standardized tests (Astin, 1976; Stronck, 1979). A similar concern for predicting the probable achievements of students is found in the admission procedures to graduate schools. Unfortunately, our universities tend to use only the grades achieved in pre-professional courses to make any predictions about the possible success of students in advanced undergraduate courses. The published literature lacks studies comparing levels of achievement in the pre-professional courses. The use of only grades achieved in the pre-professional courses seems unwise when we recognize that between 1969 and 1976, A and B grades in American higher education rose from 35 percent to 59 percent of the total (Lamont, 1979).

The central question of this study is: Do grades achieved in advanced undergraduate courses at one nursing college correlate well with grades achieved in the prerequisite courses completed at a variety of colleges and universities? One nursing college in the Pacific Northwest annually admits 177 new students from approximately 230 applicants. This study considers three years of classes totaling 492 students admitted from six different classifications of institutions of higher education: A.) a local community college; B.) local small private four-year colleges; C.) distant community colleges; D.) distant universities; E.) a local state college; and F.) a large local university.

The prerequisite science courses for admission to this nursing college are the following: anatomy and physiology, chemistry, microbiology, and nutrition. The advanced science courses taught at the nursing college are pathophysiology, essentials of pharmacology, and advanced nursing. The subjects of this study were admitted into the nursing college with differences in their grades in the prerequisite science courses completed during their first two years of college. The differences among the six classifications of institutions of higher education were significant at the 0.04 level. The number of students in each classification with the grade point averages (based on a scale of 4.0) is given in Table 1. Note that the GPAs rank the classifications from highest to lowest in the sequence from A to F.

Also in Table 1 are the GPAs on the advanced science courses. These GPAs for

TABLE 1. Grade point averages in science courses by students in six classifications of institutions of higher education.

Classification	Prerequisite	Rank	Nursing Courses	Rank	N
A. Local community college	3.4734	1	2.5833	6	36
B. Local private colleges	3.3979	2	2.7597	5	43
C. Distant community colleges	3.3734	3	2.8627	4	34
D. Distant universities	3.3231	4	2.9755	2	74
E. Local state college	3.3026	5	2.9645	3	122
F. Local large university	3.2517	6	3.1075	1	183

each classification of institution differed at the 0.001 level of significance. The sequence of ranking on the achievements in the advanced science is almost the reverse of that for the GPAs on the prerequisite science courses (P equals -0.0429). This very strong negative correlation suggests that the grades in prerequisite courses should be interpreted according to the classification of the institution awarding the grade. For example, students in classification A tend to fall by almost 0.9 GPA from prerequisite courses to advanced science courses. On the other hand, students in classification F had a decline of less than 0.15 GPA. These data suggest that students in the last classification will probably have a negligible change in grade between prerequisite courses and advanced science courses. Nevertheless, the decline of almost a full point on the GPA among students of the first classification suggests the grading on the prerequisite courses was much less rigorous in this college than at the large local university.

TABLE 2. Grade point averages in all courses by students in six classifications of institutions of higher education.

Classification	Prerequisite	Rank	Nursing Courses	Rank	N
A. Local community college	3.3919	2	2.7700	6	36
B. Local private colleges	3.4381	1	2.8275	5	43
C. Distant community colleges	3.2651	5	3.1400	3	34
D. Distant universities	3.2101	6	3.1847	2	74
E. Local state college	3.3025	4	3.0180	4	122
F. Local large university	3.3266	3	3.1923	1	183

Table 2 provides the cumulative GPAs of the students before their admission to the nursing college. The ranking of these average GPAs on all courses before admission does not follow the simple pattern from A to F, i.e., from the local community college to the local large university. The most notable exception is that students coming from distant institutions (usually at least 150 miles away) had the lowest cumulative GPAs among those who were admitted. Nevertheless, the grades achieved by all students at the nursing college tended to resemble strongly the pattern on the three advanced science courses. The only strong exception here is the achievement of students from the local state college; their ranking remained unchanged. The correlation again was negative (P equals -0.600). The drop in GPAs between the cumulative GPA before admission and that achieved at the nursing college ranged from a maximum of 0.622 GPA in classification A to only 0.026 in classification D.

By contrasting the grading in advanced science courses at the nursing college (Table 1) with that of all courses at the same nursing college (Table 2), it is evident that

the grading in the advanced science courses is consistently more rigorous. On the other hand, no such trend is recognized when the prerequisite science courses are contrasted with the cumulative GPAs awarded before admission. The data of this study seem to indicate that the pre-professional science courses may provide grades similar to those from other introductory courses.

The most obvious conclusion from this study is that the levels of achievement and the rigor of grading in pre-professional science courses vary significantly among some colleges and universities. Although grades in prerequisite courses are generally good predictors of achievement in advanced courses, the type of institution awarding the grade is an important variable. According to Lamont (1979), those institutions which are most concerned about falling enrollments will tend to award credit for insufficient academic work and to tolerate continued grade inflation. Ashworth (1979) advocates the removal of those federal directives which encourage lower standards in institutions of higher education. Perhaps greater uniformity in the meaning of grades can be encouraged through providing faculty with comparative data on the achievements of their students in more advanced courses.

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