The Current Status of Academic Standards in Engineering Education at Ohio University

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Ohio University

Abstract

Some results are presented from a recent study of academic standards at Ohio University. Findings for both the university and its Russ College of Engineering and Technology are described, contrasted and compared for 1993 and 1999 with due consideration given to the academic caliber of students entering the college and university, as measured by standardized test scores and high-school class standing. Some implications of these findings are described as well as their place within the overall flux of national academic standards in higher education as reported in the literature.

I. Introduction

The distribution of letter grades awarded for academic achievement in higher education in the United States has changed considerably since the 1960s. Levine and Cureton found that in 1969, 7 percent of students received grades of A- or higher while 25 percent received grades of C or lower and that by 1993 these figures had essentially reversed—becoming 26 percent and 9 percent respectively.1 Other reports of changing academic standards (alias grade inflation) have appeared in the literature;2-25 Gibson’s recent grade-inflation satire26 is indeed indicative of the current academic standards milieu.

These changes are important because acknowledgement of academic achievement has become distorted and this distortion is exacerbated by inconsistent grading standards across the university. In an effort to preserve the traditional cachet of graduating with highest academic achievement, Ohio University responded in 1999 by changing its overall average grade requirement (on a four-point scale) for the honorific summa cum laude from 3.5-4.0 to 3.9-4.0.27

In addition, the influence of changing standards extends beyond purely academic considerations. For example, some undergraduate scholarships available to all students at the university (regardless of their major area of study) are based on academic merit, i.e.; grades. Given this award apparatus along with variable grading standards across the university, students majoring in disciplines that grade more generously than others may unfairly benefit financially.27

Student fairness and equity issues have a faculty counterpart. There have been nearly two thousand studies of student evaluation of teaching (SET), making this topic perhaps the most extensive area of research in higher education—and there is wide agreement among scholars that SETs
are a good measure of teaching efficacy.\textsuperscript{28} However, some recent studies cast doubt on the value of SETs and suggest that they foster lower standards (by way of inflated grades) and encourage faculty to dumb-down their courses for reasons pertaining to the impact of SETs on tenure, promotion in rank and salary increases.\textsuperscript{28-35} Apart from conflicting research findings, there is the perception that SETs foster lower standards.\textsuperscript{6, 36-39}

State governments have increased interest in assessing and controlling the performance of public universities.\textsuperscript{40-42} In Ohio for example, the Ohio Board of Regents has implemented \textit{Success Challenge}, a program which, through budgetary control, seeks to improve graduation rates for both at-risk students as well as \textit{all} students at state supported universities in Ohio.\textsuperscript{43} The extension of this sort of budgetary control to academic performance and standards seems plausible\textsuperscript{44-52} given that grade inflation driven grade compression (at the top) coupled with varying standards across campus, make evaluation of candidates for employment and graduate school admission purposes problematic.\textsuperscript{53} In this regard, some state government mandated standardized testing of university students has already begun.\textsuperscript{54-56}

Changing academic standards are also important to engineering education, where the role of assessment has recently grown in importance as a result of new accreditation requirements (ABET EC2000).\textsuperscript{57-58} Grades are the linchpin holding student academic performance and program assessment together. As marks of scholastic achievement, grades measure student learning, and as such, they gauge how well academic programs, such as those in the engineering disciplines, succeed in their educational missions.

Grade inflation began during the 1960s\textsuperscript{59-60} (Vietnam War\textsuperscript{61}) and by the 1980s was built into higher education.\textsuperscript{4} Sacks attributes the continuation of grade inflation beyond the war years to the increasing influence of postmodernism in American society.\textsuperscript{6} Regardless of its causes, grade inflation is ubiquitous and its impact is important.

II. The Teacher Evaluation of Learning Committee and Its Findings

In the spring of 2000, Ohio University's central administration commissioned a study of the grade inflation phenomenon at the university. Thus the Teacher Evaluation of Learning Committee (TELC) was formed for this purpose by Ohio University Provost Sharon Stephens Brehm.

In addition to holding discussions and considering testimony, the TELC gathered voluminous undergraduate grade data across many cohorts of the university. Undergraduate grades were collected for the fall quarters (terms) of 1993 and 1999 for the university en masse as well as for the following sectors: the principal academic divisions (colleges) of the university, course levels (i.e., the freshman, sophomore, junior and senior levels), faculty tenure status (i.e., tenured faculty, non-tenured tenure-track faculty and faculty not eligible for tenure) and faculty gender.

The TELC’s findings are summarized in a report submitted to the provost in June of 2000.\textsuperscript{27} Here however, only findings for the university's Russ College of Engineering and Technology (RCENT), and for comparison purposes, the university in toto (OU) are presented.
Undergraduate grade data are shown in table 1. This data was amassed on a per-credit basis to avoid introducing spurious bias into the course-grade descriptive statistics which would result from counting courses carrying different credits equally. By assembling the data this way, the grade measurements are compatible with the grade-point-average (GPA) calculation widely used in American higher education.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Fall 1993</th>
<th>Fall 1999</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RCENT (%)</td>
<td>OU (%)</td>
</tr>
<tr>
<td>A</td>
<td>14.73</td>
<td>19.89</td>
</tr>
<tr>
<td>A-</td>
<td>11.06</td>
<td>12.62</td>
</tr>
<tr>
<td>B</td>
<td>17.03</td>
<td>16.28</td>
</tr>
<tr>
<td>B-</td>
<td>10.09</td>
<td>8.81</td>
</tr>
<tr>
<td>C+</td>
<td>7.97</td>
<td>6.91</td>
</tr>
<tr>
<td>C</td>
<td>10.75</td>
<td>9.47</td>
</tr>
<tr>
<td>C-</td>
<td>3.42</td>
<td>4.01</td>
</tr>
<tr>
<td>D+</td>
<td>2.25</td>
<td>2.05</td>
</tr>
<tr>
<td>D</td>
<td>2.87</td>
<td>2.97</td>
</tr>
<tr>
<td>D-</td>
<td>1.14</td>
<td>1.18</td>
</tr>
<tr>
<td>F</td>
<td>6.20</td>
<td>4.16</td>
</tr>
</tbody>
</table>

Table 1. Fall quarter letter-grade percentages, 1993 and 1999

Table 2 tabulates the more coarse whole-letter-grade counterparts A, B, C, D and F formed by aggregating the percentages of each letter grade in table 1 with its ± gradations, e.g.; where tabulated percentages in table 1 for B-, B and B+ are added together to obtain corresponding percentages in the B grade-range category (row) of table 2.

<table>
<thead>
<tr>
<th>Grade</th>
<th>1993</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RCENT (%)</td>
<td>OU (%)</td>
</tr>
<tr>
<td>A</td>
<td>25.79</td>
<td>32.51</td>
</tr>
<tr>
<td>B</td>
<td>39.61</td>
<td>36.76</td>
</tr>
<tr>
<td>C</td>
<td>22.14</td>
<td>20.39</td>
</tr>
<tr>
<td>D</td>
<td>6.26</td>
<td>6.20</td>
</tr>
<tr>
<td>F</td>
<td>6.20</td>
<td>4.16</td>
</tr>
</tbody>
</table>

Table 2. Fall quarter whole-letter-grade percentages, 1993 and 1999

RCENT whole-letter-grade percentages for fall 1993 and fall 1999 are shown in figure 1; OU counterpart percentages are shown in figure 2.
The academic aptitude of students was measured by way of SAT and ACT standardized test scores as well as high school class standing and found to be essentially constant over the period 1993-1999. This finding is consistent with national SAT scores for 1989-1999. The trend of national ACT scores is reported to be steadily increasing since 1990 but flat the past four years.

The following observations are noteworthy. Compared to the academic standards reported by Levine and Cureton for 1969, grade inflation is evident in both years for both the college and the university with more inflation in 1999 than in 1993. In 1999, grades A- and above total nearly 38 percent for RCENT and nearly 36 percent for the university (table 2), while grades C or lower are roughly 20 percent and 21 percent respectively (table 1). Furthermore, in 1999 the most frequently occurring grade for both RCENT and OU is A (not A and A- combined, but A alone). For 1999, these modes are 24.27 percent A for RCENT and 22.68 percent A for OU (table 1).
Within each year, RCENT and OU grade distributions are similar to one another. This suggests that RCENT grading standards and inflation are similar to those for the university en bloc. Grade-point-averages (using numerical weights of 4.0 for A, 3.0 for B, 2.0 for C, 1.0 for D and 0.0 for F) for the whole-letter-grade histograms for 1999 are 2.98 and 2.95 for RCENT and OU respectively. For 1993, the RCENT and OU histogram GPAs are 2.73 and 2.87 respectively.

The TELC deemed these and other findings unsatisfactory and detrimental to the university's mission.27

III. Recommendation and Conclusion

Academic standards at Ohio University have been found to be inflated. A valuable next step is to consider them against the backdrop of national standards in order to reasonably and realistically gauge their meaning in the broader national context. Therefore, it is recommended that a national study of academic standards be undertaken under the aegis of perhaps a coalition of suitable organizations. This would provide useful benchmarks against which many colleges and universities could, by performing local studies such as described herein, evaluate their own academic standards situation. In addition, periodic national studies40 could foster continuous improvement68-69 of academic standards nationally.

The causes of grade inflation are not fully understood. However, some plausible inferences can be drawn from the following facts. In 1900, only about 10 percent of American adolescents aged 14-17 were enrolled in high schools, about 6 percent of teenagers graduated from high school and most of these students were from affluent families.70 High school was largely for the children of the elite of American society, i.e.; for the privileged having academic ability. So the spectrum of student demographics, both social and academic, was narrow. At the beginning of the twentieth century, about 2 percent of Americans from the ages of 18 to 24 were enrolled in a college, there were about 1000 colleges then, with enrolment totaling about 157,000.70 Around that time, at Ohio University, there were 232 students71 in 1897 and 23 faculty72 in 1901.

In 1995, 87 percent of Americans between age 25 and 29 had graduated from high school.70 Nowadays, more than 60 percent of high school graduates go on to some form of post-secondary education73 and there are over 14 million students enrolled in about 4000 four-year and two-year colleges.74 So higher education has moved from a former elitist system to the present mass system. Ohio University has followed suit with 28,407 students (total) and 773 full-time faculty (Athens main campus) in 1999.75

In his 1997 State of the Union address, President Clinton called for the creation of public policy to enable virtually every high school graduate to receive some form of college education.70 The realization of this national goal will move higher education from mass education to universal education—where high school essentially is now, with higher education not too far behind already.
While this evolution is occurring, quite naturally, the spectrum of student demographics (again both social and academic) is diverging (broadening) to more closely resemble that of present-day American society. The phenomenon of grade inflation over the past thirty years or so may be a result of higher education's simultaneous accommodation of the wider spectrum of academic aptitude of the cohort entering the university (consider the issues of remediation, retention and graduation rate for example) while struggling to retain its former elitist values (consider the high interest in quality issues, e.g.; the excellence that is so commonly expected nowadays by so many stakeholders in all strata of education—so as to render the word a hackneyed cliché, its meaning having undergone a sort of grade inflation of its own).

As the spectrum of student academic ability has widened, perhaps the traditional distinction awarded to those with the best academic performance is being forfeited by way of grade inflation (through grade compression at the top)—in order for the university to co-opt (graduate) the academically weak that in the earlier elitist era comprised a smaller portion of the student population. In other words, maybe grade inflation is a consequence of conflict between the emerging egalitarian ideal of universal higher education, society's desire to retain the elitist academic standards of an earlier (extinct) era, and its apparently growing belief (misconception) that academic excellence is a commodity the university is able to bestow upon all students regardless of their academic aptitude.

In addition, and as mentioned earlier (i.e.; Sacks' hypothesis), perhaps the growing influence of postmodernism on American society over the past several decades has contributed to entrenching grade inflation within the zeitgeist of higher education. Whatever its causes, grade inflation is unwholesome. It is hypocritical yet its remedy is elusive. It is beneath the dignity of reputable universities yet it is a longstanding commonplace. As for engineering education at Ohio University, its academic standards are similar to those of the university at large—which are inflated and ipso facto debase the university by, inter alia, nullifying the traditional distinction of high academic achievement. Time will tell how effectively the university will redress the debilitating phenomenon of grade inflation.

References

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43. URL: http://www.regents.state.oh.us/hei/success/successchallenge.html


64. Scott Carlson, "College Board Reports Little Change in Average SAT Scores," *The Chronicle of Higher Education*, 10 September 1999. URL: http://chronicle.com/chronicleweekly/v46/i03/03a05601.htm


72. Ibid., 194.
77. Lucas, Crisis In The Academy, 204-205.
78. Ashworth, American Higher Education in Decline, 58, 104.
79. James Lee, "OU should look at how other institutions have dealt with grade inflation," The Athens NEWS, 18 December 2000, 5. URL: http://www.athensnews.com/
84. Ibid., 12.
87. Sykes, ProfScam, 85-87.
103. The editors of *Lingua Franca* eds., *The Sokal Hoax: The Sham That Shook the Academy* (Lincoln, Nebraska: University of Nebraska Press, 2000), passim.
112. Sokal and Bricmont, “Epilogue,” in *Fashionable Nonsense*, 182-211.

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