

Assurance of Learning: An Evaluation of How Grade Inflation and Course Pedagogy Impacts Students' Learning Sustainability in Business Core Courses

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The Major Field Test in Business and the Comprehensive Business Exam are both used by higher education institutions for business program assurance of learning (AoL) purposes. However, the impact of grade inflation and course pedagogy on AoL analysis has not been explored in the literature, and the present paper extends the research stream in this area. The active learning approach to course pedagogy was identified as a contributor to student learning sustainability and how grade inflation confounds the AoL process was explored. Implications for improving students' learning outcomes are presented.

INTRODUCTION

The Major Field Test in Business (MFTB) and the Comprehensive Business Exam (CBE) are two standardized tests employed for assurance of learning (AoL) purposes at higher education institutions (Barboza & Pesek, 2012; Bielinska-Kwapisz, Brown & Semenik, 2012; Hahn, Bowlin, & Welch, 2011; Hahn & Leslie, 2017; Ling, Bochenek, & Burkander, 2015; Settlage & Settlage, 2011; Suh, 2014). Each exam assesses information in business core course content areas, such as accounting, finance, management, marketing, economics, legal, and international; and colleges and universities use MFTB and CBE results to monitor institutional performance over time, as well as to compare to a peer group. AoL research has not explored how course pedagogy and grade inflation relates to MFTB and CBE outcomes, or how these factors influence students' learning sustainability, thus presenting a rich opportunity to extend the research stream in this area.

This paper examines how pedagogy and grade inflation influence the interpretation of MFTB and CBE results for AoL assessment at a medium-size Christian university. Regression analysis was employed to identify predictors of CBE success. To test the sustainability of learning, correlation analysis was conducted by examining the relationship between course grade and CBE scores on accounting, finance, management, and marketing core course concepts. Finally, the data were further separated at the instructor level, and analysis of this subgroup identified pedagogy that promotes learning sustainability.

Results of regression analysis found that students' CBE scores are driven by ACT score, as well as by GPA, gender, and major. Such finding is consistent with prior research. However, results of statistical tests in the present study also identify course pedagogy as a contributor to CBE outcomes. When the data were separated at the course level, correlation analysis revealed a high correlation between accounting course grade and accounting concepts tested by the CBE, whereas correlations for finance, management, and marketing were weak. The strength of the accounting correlations is primarily attributable to the use

of an active learning approach by instructors delivering the principles of accounting course. In an important extension of the research stream in this area, the data were examined at the instructor level for both correlation and grade distribution. This deep analysis disclosed significant grade inflation and low learning sustainability in finance, management, and marketing courses. Based on the research findings, implications for AoL practice are presented.

LITERATURE

Standardized Exams

Regional accrediting commissions, as well as independent business school accrediting organizations such as The Association to Advance Collegiate Schools of Business (AACSB), require AoL assessment as part of their accreditation policy. Standardized tests, such as the MFTB and the CBE, are commonly employed as direct measures for this purpose (Barboza & Pesek, 2012; Bielinska-Kwapisz et al., 2012; Bisalski, Helms, & Whitesell, 2017; Hahn & Leslie, 2017; Ling et al., 2015; Suh, 2014).

The extensive use of standardized exams as a direct measure of student learning is one way to obtain evidence of student learning sustainability. Such exams are popular because test developers have examined the questions employed in the testing instrument to assess reliability and validity of results (Lakhal & Sevigny, 2015). In addition, reliability and validity has been confirmed by the extensive employment of these tests in the AoL process by U.S. colleges and universities. Indeed, Marshall (2007) reports that 46 percent of AACSB accredited schools use the MFTB for this purpose. The extensive use of the MFTB and CBE provides evidence that these tests measure the sustainability of student learning from individual course delivery date to the end of program testing date. This is consistent with Black and Duhon's (2003) finding that standardized exams can be an effective way of assessing sustainability of student learning. Finally, the ability of standardized exams to measure student learning sustainability is an underlying premise of the No Child Left Behind Act of 2001.

Prior research identified a strong association between students' MFTB or CBE scores and students' capability as determined by SAT or ACT scores (Barboza & Pesek, 2012; Bielinska-Kwapisz, et al., 2012; Black & Duhon, 2003; Bycio & Allen, 2007, Hahn & Leslie, 2017). MFTB and CBE research also reports that men outscore women (Bagamery, Lasik, & Nixon, 2005; Chowdhury & Wheeling, 2013; Contreras, Badua, Chen, & Adrian, 2011; Mason, Coleman, Steagall, Gallo, & Fabritius, 2011; Settlage & Settlage, 2011), and accounting and finance majors outscore other majors (Bielinska-Kwapisz, et al., 2012; Bycio & Allen, 2007; Chowdhury & Wheeling, 2013; Hahn et al., 2011; Hahn & Leslie, 2017; Word & Rook, 2012).

Institutions also use GPA as an indicator of student performance. However, as discussed in the following section, GPA is losing value as a capability differentiating measure due to grade inflation.

GPA and Grade Inflation

While GPA is often employed as a performance measure, it has shortcomings. First, GPA is an average of performance on a course-by-course basis and, as such, captures learning at the point in time each course is completed. In contrast, the CBE and MFTB capture learning that is sustained at the time students complete their undergraduate degree program. Second, studies point out that grade inflation is distortive, and if present, limits GPA's usefulness as a measure of student accomplishment for both employers and graduate school admission counselors (Bar, Kadiyali, and Zussman, 2012; Ling et al., 2015).

Rojstaczer and Healy (2012) found that “. . . A's represent 43% of all letter grades, an increase of 28 percentage points since 1960 and 12 percentage points since 1988. D's and F's total typically less than 10% of all letter grades” (p. 1). Consistent results were reported in other research (Bar et al., 2012; Carter & Lara, 2016; Hubbell, 2015; Lowe, Borstorff, and Landry, 2008; Sonner, 2000; Tucker & Courts, 2010), whereas Pattison, Grodsky, and Muller (2013) reported that average college students' GPA has declined from 2.73 in 1972 to 2.33 in 1992. For business majors, Lowe et al. (2008) report that business graduates' GPA “. . . was higher than graduates from engineering, life sciences, mathematics, and physical sciences,

but less than education and professional fields” (p. 15), and within a business school setting, Barth, Liu, and Wells (2009) found that grades in management, marketing, and logistics were significantly higher than grades in accounting, economics, and finance.

In recent studies, there is no consensus on reasons for grade inflation (Carter & Lara, 2016), but theories proliferate. The most commonly cited reasons are faculty concerns about how administrators will use grades for faculty retention and promotion (Hubbell, 2015; McCall, 2011; Rojstaczer & Healy, 2012; Tucker & Courts, 2010), the impact of grades on student evaluation of faculty (Kamber & Biggs, 2004; Hubbell, 2015; McCall, 2011; Tucker & Courts, 2010), student retention efforts driven by the idea that students are consumers (McCall, 2011; Rojstaczer & Healy, 2012; Tucker & Courts, 2010), and the increased use of adjunct faculty (Hubbell, 2015; Sonner, 2000). Finally, McCall (2011) cites improved teaching skills, faculty being more willing to accept retests and paper revisions, students repeating courses to remove a low grade, and students taking lighter course loads to gain additional study time as contributory to grade inflation.

Not only do inflated grades send incorrect signals to employers and graduate programs, such grades confound the AoL assessment process. For, as Kamber and Biggs (2004) point out, “. . . grades have a ceiling, so that grade inflation is inevitably grade conflation” (p. 34). In other words, if all students receive a grade of A, there is no basis for differentiating capability among students. Grade reform is needed, but until change is realized, AoL efforts should focus on standardized tests as one way to differentiate learning sustainability among students (Kamber & Biggs, 2004; Rojstaczer and Healy, 2012).

Research Questions

Based on the literature presented previously, the research questions are:

RQ₁. What variables are predictors of CBE performance?

RQ₂. Are there differences in CBE performance among majors?

RQ₃. Is there a relationship between course grades and CBE scores in course content areas?

RQ₄. Does grade inflation impact assessment results?

METHOD

The CBE was used to capture assessment scores for four core course subject areas examined in the present study: accounting, finance, management, and marketing. Business faculty reviewed the content coverage in each of these subject matter areas and found that questions on the CBE were representative of key concepts taught in each course. The CBE served as the dependent variable for data analysis purposes.

Students’ demographic information and course grades served as independent variables, and were obtained from the registrar’s database. CBE scores were acquired from that test’s score report for 59 senior students in three business policies classes during the 2016-2017 academic year. The CBE was administered in business policies classes by the author during the eighth week of the fall and spring semesters. This exam constituted 10% of the course grade.

The capability level of male and female students was similar as assessed by comparing key variables for males (CBE 71.0, ACT 22.0, and GPA 3.2) and females (CBE 68.3, ACT 23.8, GPA 3.5). The data were examined using regression analysis, independent-samples Kruskal-Wallis tests, and correlation analysis. Results are reported in the next section.

RESULTS

To investigate *RQ₁*, a regression analysis was conducted to determine which variables are predictors of CBE performance. Results are seen in Table 1, and the identification of ACT, GPA, gender, and major as statistically significant determinants of CBE performance is consistent with findings in prior research.

RQ₂ asked if there are differences in CBE performance among majors. Because the data are not normally distributed, an independent-samples Kruskal-Wallis test was conducted to determine if there

were differences between CBE scores for the major group variables: “accounting” (n = 14), “finance” (n = 6), “management” (n = 18), “marketing” (n = 5), and “other” (n = 16)¹. Visual inspection of box plots indicated that distributions were similar. Results found a statistically significant difference between the distributions of majors, $\chi^2(2) = 11.119$, $p = .049$. Post hoc tests were run employing a Bonferroni correction for multiple comparisons. There was a statistically significant difference between median CBE scores for management (23.58) and accounting (42.00) majors ($p = .026$), but not for any other combination of majors. Kruskal-Wallis tests were also conducted for grades and CBE scores on a major-by-major basis to determine if there were performance differences between major groupings. Results are reported in the following section.

TABLE 1
LINEAR REGRESSION ANALYSIS

Variable	B	SE _B	β	t	p
Intercept	-11.59	16.62		-.70	.489
ACT	2.07	.53	.41	3.92	.000
GPA	18.49	3.78	.47	4.90	.000
Major	-3.46	1.21	-.30	-2.86	.006
Gender	-11.70	4.32	-.27	-2.71	.009

Note: *Significant at 95% confidence level; B = unstandardized regression coefficient; SE_B = standard error of the coefficient; β = standardized coefficient. Model R² = .60

Major Performance

To investigate performance of students by CBE content area, the sample was divided and an independent-samples Kruskal-Wallis test was conducted by comparing students majoring in each discipline to their CBE scores for the accounting, finance, management, and marketing course content areas.

Accounting

For CBE score distributions, an independent-samples Kruskal-Wallis test identified a significant difference $\chi^2(5) = 19.067$, $p = .004$ between major groups. Visual inspection of box plots indicated that distributions were not similar. Post hoc tests, with a Bonferroni correction, were conducted and a significant difference was found between medians for accounting (41.39) and management (22.92) majors, ($p = .000$) on accounting concepts examined by the CBE. No other combination of majors showed significant differences. There was no difference in accounting course grade distributions between accounting majors and other majors as reported by an independent-samples Kruskal-Wallis test $\chi^2(6) = 6.016$, $p = .421$. Visual inspection of box plots indicated that all distributions were similar.

Finance

There was no significant difference in finance course grade distributions between finance and other majors as reported by an independent-samples Kruskal-Wallis test $\chi^2(5) = 3.120$, $p = .681$, but there was a significant difference in CBE score distributions among these majors $\chi^2(5) = 15.209$, $p = .010$. A visual examination of box plots indicated that distributions were similar for both grade and CBE score groups. Post hoc tests on CBE scores, employing a Bonferroni correction for multiple tests, revealed statistically significant differences between medians for finance majors (44.36) and both management (26.00, $p = .021$) and marketing majors (16.20, $p = .026$) on finance concepts tested by the CBE. There were no significant relationships between other major combinations.

Management

Management course grades and CBE scores were analyzed using an independent-samples Kruskal-Wallis test. Distributions of each group were similar based on a visual inspection of box plots. There was no significant difference between majors for management course grades $\chi^2(5) = 2.518$, $p = .774$ or CBE scores on management concepts $\chi^2(5) = 5.253$, $p = .386$.

Marketing

An independent-samples Kruskal-Wallis test on marketing course grades and CBE scores did not find a statistically significant difference between majors for course grades $\chi^2(5) = 2.793$, $p = .732$ or CBE scores on marketing concepts $\chi^2(5) = .547$, $p = .980$. A visual inspection of box plots indicated that distributions of both groups were similar.

Correlation Analysis

To investigate RQ_3 , is there a relationship between course grades and CBE scores in course content areas, a Pearson product moment correlation was conducted for accounting, finance, management, and marketing courses by comparing the grade earned in each of these courses to the CBE score achieved on content questions related to each course. As seen in Table 2, students' grades in the principles of accounting course show strong correlation between course grade and CBE score. In contrast, finance and management, and marketing have low correlation coefficients between these two measures. International and MIS majors were excluded from this aspect of the study primarily because previous studies did not include these two majors in reported results.

TABLE 2
CORRELATION OF COURSE GRADE TO CBE SCORE

Course	N	Correlation CBE		Course Grade Distribution			
		<u>r</u>	<u>p</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D/F</u>
Accounting	59	.666**	.000	22	47	29	2
Finance	59	.415**	.001	44	36	10	10
Management	58	.365**	.005	57	31	9	3
Marketing	59	.273*	.036	66	27	7	0
<u>Accounting</u>							
Instructor 1	22	.573**	.005	23	55	22	0
Instructor 2	20	.694**	.001	30	44	22	4
Both 1 and 2	10	.590	.072	0	43	57	0
Transfer	7	.768**	.036	14	43	43	0
<u>Finance</u>							
Instructor 1	6	-.205	.697	83	17	0	0
Instructor 2	30	.324	.080	50	40	10	0
Instructor 3	13	.664**	.013	31	15	8	46
Transfer	10	-.024	.947	20	60	20	0
<u>Management</u>							
Instructor 1	41	.421**	.006	56	27	12	5
Transfer	17	.329	.198	59	41	0	0
<u>Marketing</u>							
Instructor 1	50	.358*	.011	68	24	8	0
Transfer	9	-.333	.381	56	44	0	0

Notes: **significant at the .01 level; *significant at the .05 level; two tailed.

To investigate RQ_4 , does grade inflation impact assessment results, the data were separated by instructor who taught each course and results are reported in Table 2. Accounting instructors demonstrated high correlation between grade and CBE results on accounting concepts and this relationship is consistent among professors. In contrast, finance correlations display inconsistency between instructors. Table 2 also presents percentage grade distributions by majors. Accounting courses have a symmetric distribution among the first three grading levels, whereas finance, management, and marketing each have distributions that are skewed to the right; providing evidence that grade inflation is prevalent in non-accounting, business core courses.

DISCUSSION

The expectation was that students in each major would demonstrate significantly higher CBE performance on major course concepts than students majoring in other areas. Independent-samples Kruskal-Wallis tests identified a statistically significant difference in CBE performance between accounting and management majors in the accounting concepts subject area, as well as a statistically significant difference between accounting majors compared to both management and marketing majors in the finance concepts subject area. This is consistent with both expectations and prior research, and is primarily attributable to those majoring in accounting having the benefit of additional upper level courses in both accounting and finance. These classes amplify a student's knowledge in that major's fundamental subject matter as compared to students in other majors who take the accounting and finance core courses in their sophomore or junior year and such courses are their only exposure to concepts in these disciplines.

Curiously, management, marketing, and finance majors did not outperform non-majors on the CBE concepts related to their discipline, even though students in each major had the benefit of additional concept coverage in their upper-level major courses. This finding is consistent with Word and Rook (2012), and may be attributable to a combination of student capability, as well as a pedagogical approach in non-accounting courses that rewards memorizing rather than learning.

A partial explanation as to why students in non-accounting majors did not demonstrate greater mastery of their discipline area on the CBE is seen in Table 2. Correlations between CBE score and course grade indicate that only the accounting course shows high correlation. This is primarily attributable to two factors. First, the accounting faculty use an active-learning approach in their core classes², and second, the course grade is developed using only four exams and quizzes. This is consistent with testing-effect theory that posits that information retention is greater when exams are used in the course delivery process (Van Deventer, 2015). All other core courses include grade inflating attendance, homework, and participation points that obfuscate assessment data.

When the data are separated by instructor, the results are more easily perceived. As seen in Table 2, each accounting core course instructor has a high correlation of course grade to CBE course concept scores, and grade distributions are symmetrically distributed across the A, B, and C range. As mentioned previously, this is primarily attributable to the active learning and no grade inflator approach to course pedagogy in accounting courses. However, one caveat should be noted. Accounting instructor one has a correlation of .573. This is partially impacted by two accounting majors who received low grades in the principles courses, but through the repetition of core concepts covered in upper-level accounting courses scored well above average on CBE accounting concept questions. When these two students are removed from the analysis, this instructor's correlation increases to .776.

This example highlights how a correlation might be misleading. The present study identified courses where a low grade was earned in a core course, but CBE results were significantly higher than expected due to an increase in learning through repetition of basic concepts in upper level courses. Conversely, cases were identified where a student's course grade was high, but CBE scores were low for those majoring in that particular content area. This is troublesome because it suggests that additional intimacy with core course concepts in upper level major courses is not promoting learning stickiness. The take-

away is that drilling deeply into the data, and using judgement in interpreting results, is appropriate when assessing learning outcomes at the course and instructor level.

The finance results, when separated by instructor, are erratic as seen in Table 2. Instructor one has a negative correlation, and grade inflation is indicated as five of six students received a grade of A for the course but earned a score at, or below, the C level on CBE finance course concept questions. In contrast to accounting outcomes discussed previously, results for this instructor suggest that course pedagogy does not promote sustainable learning, as four of the students were finance majors. This is a surprise, as expectations were that finance majors would score in the A and B range on the finance concept questions covered by the CBE because they benefited from review of fundamental core course concepts in upper-level finance major classes.

Instructor three has a high correlation of finance course grade to CBE finance concept results. This instructor uses an active learning approach in the classroom similar to that employed by accounting instructors. In addition, all course grades are determined using only tests and quizzes. In this class, 46% of students received a grade of D or F, and all those in this category either missed over six classes or did not prepare homework assignments on a consistent basis. This data suggests grade inflation is low for this instructor and that students perform on the CBE consistent with their grades in this course, providing evidence of learning sustainability. Instructor two has a low correlation and this is primarily attributable to grade inflation. About 40% of the course grade in this class was developed from attendance, participation, and homework, and 90% of the grades in this class were A or B, which is suggestive of grade inflation.

Management and marketing instructors have a low correlation of CBE concept question score to course grade, and the grade distributions seen in Table 2 show management grades consist of 83%, and marketing grades 92%, of A's and B's. Both the management and marketing instructors use lecture as a primary course delivery technique as well as in-class projects. The exams in the management class are primarily fill-in-the-blank. The marketing class uses multiple-choice exams and online multiple-choice, open-book quizzes. Both classes include projects and participation in determining a course grade. It is clear that grade inflation has an impact on correlation results and diminishes the ability to use grades to evaluate students' capabilities in these subject matter areas.

The present paper found support for Rojstaczer and Healy (2012) whose study reported that 43% of all grades awarded in higher education are A's, and that grades are becoming meaningless in terms of differentiating capability among students. This finding, when compared to the statistically significant CBE exam differences among majors reported above, provides evidence that grade inflation is present, as there is insufficient variation in reported grades among subgroups for statistically significant differences to be identified. In addition, Table 3 presents descriptive data for both GPA and CBE scores. As seen in this table, the higher mean GPA in the management and marketing courses is consistent with findings by Barth et al. (2009) and is suggestive of grade inflation which diminishes the usefulness of grade in assessing differences in student accomplishment. The workplace agrees, based on anecdotal evidence from employers of our graduates. Employers report that they no longer review a student's transcript from colleges because they do not find grades to be a differentiating indicator. Instead, they rely primarily on either (1) assessment of capability by monitoring an internship or (2) a recommendation from an instructor in a student's major.

TABLE 3
DESCRIPTIVE STATISTICS FOR STUDENT GPA AND
CBE SCORES BY CORE COURSE SUBJECT

Core Course Subject	N	<i>M</i> GPA ¹	GPA SD	GPA Min ¹	GPA Max ¹	<i>M</i> CBE ²	CBE SD	CBE Min ²	CBE Max ²
Accounting	59	3.13	.82	1	4	70.1	13.32	32	100
Finance	59	3.12	.98	1	4	66.2	20.03	25	92
Management	58	3.41	.80	1	4	69.1	17.75	20	93
Marketing	59	3.59	.62	2	4	68.7	17.92	33	100
Bus. Total ³	59	3.32	.52	2.2	4	69.6	13.32	35	93

¹GPA: 4=A, 3=B, 2=C, 1=D

²CBE is the percentage of questions answered correctly in the specified core course subject area

³Data for GPA includes all eleven business core classes. The CBE is the average total percentage correct responses for all 88 questions included in this exam

Implications for AoL purposes are fourfold for institutions seeking to improve students' learning outcomes. First, grades may, or may not, reflect what was learned during a class, whereas CBE scores reflect how much of what was learned in a class was sustained over time. Thus, use of a standardized exam, such as the CBE or MFTB, is important for AoL purposes. Second, by drilling deeply into students' performance, by comparing outcomes between course grade and standardized test scores at the subject area level, insights as to which teaching methods produce sustainable results can be identified and used to encourage other faculty to modify their classroom approach to incorporate techniques that fosters learning sustainability. Third, incorporating a criterion-referenced component to the evaluation process and linking it to norm-referenced measures, such as a grade or CBE score, will enhance the AoL effort (Lok, McNaught, & Young, 2016). Finally, by assessing the correlation of course grade and CBE test outcomes at the instructor level, instructors whose pedagogy lacks rigor, or whose grades do not reflect learning reality, can be identified for mentoring aimed at improving student learning outcomes.

The deep assessment method set forth in the present paper requires time and effort, but it provides insightful evidence for AoL purposes, and such evidence is useful for monitoring and adapting both institutional and instructor level performance, which will, in turn, result in increased levels of sustained learning among students.

CONCLUSIONS

In an important expansion of the AoL literature, the relationship between course grade and standardized test scores on student learning sustainability was explored. Accounting instructors using an active learning approach demonstrated high correlation of course grade to CBE accounting course concept scores, providing evidence that this pedagogical approach produces high student learning sustainability. In contrast, instructors in finance, management, and marketing, whose pedagogical approaches promoted grade inflation, were unable to demonstrate high levels of sustained student learning. Based on this evidence, colleges seeking to achieve sustainability of student learning should consider employing an active learning pedagogical approach with grade determination that is based primarily on in-class exams and quizzes. Finally, by employing the deep analysis method modeled in the present study, AoL evidence useful for identifying instructor-level pedagogical approaches that do not result in sustainable student learning can be identified, and once identified, appropriate adaptations made in order to elevate students' learning outcomes.

Like most studies, the present study is not without limitations. First, the sample size is small and includes students from one institution covering one academic year, which may limit the generalizability of results to other institutional settings. Future research might take a longitudinal approach and include multiple institutions. Second, the CBE was employed as the dependent variable. Future research might employ the MFTB for this research purpose. Third, the impact of innate capability was not considered in the analysis. Future research might explore the impact of capability in relationship to the use of standardized testing for AoL purposes. Finally, only the active learning approach was identified as a method that sustains students' learning. Future studies might explore how other pedagogical approaches influence sustainable learning outcomes.

ENDNOTES

1. Other includes management information and international business majors. These majors were not included in prior research, and are only used for this test in the present study.
2. This active learning approach includes homework and in-class problem solving with assignments designed to repeat concepts at spaced intervals. Also, instructors wander around the classroom while students are reviewing solutions or solving problems, and this provides insight as to concepts that need future explanation and review.

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