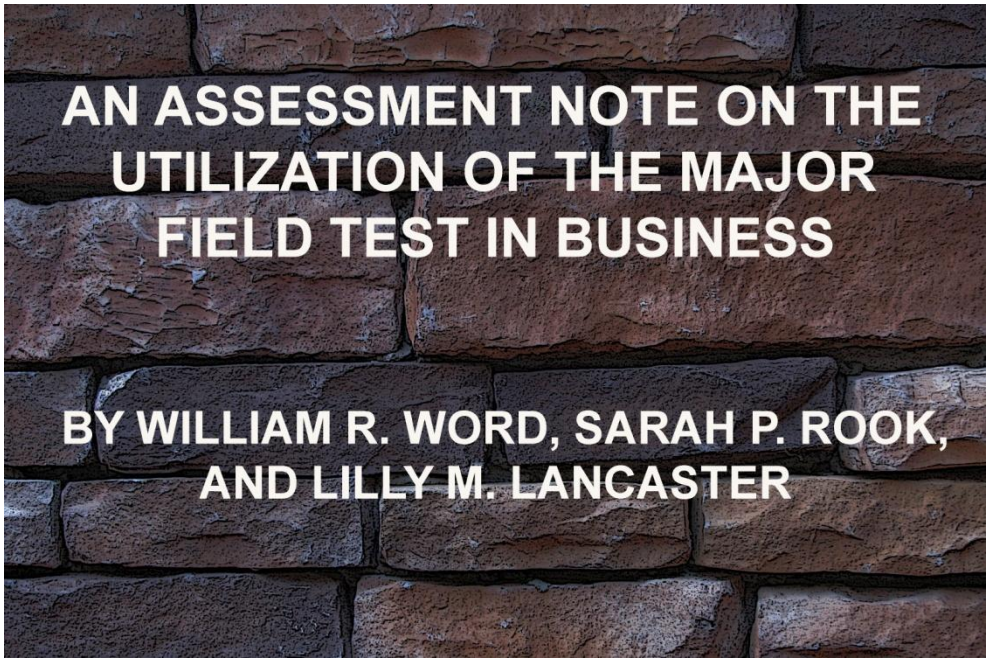

Peer Reviewed

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Abstract

The research described in this paper demonstrates an approach for using the Educational Testing Service (ETS) Major Field Test in Business (MFTB) for assessment at a small, public AACSB-International accredited undergraduate business program. MFTB results were analyzed for subgroups of students in the business program. The students' concentrations were either in accounting, economics, general business, management, or marketing. The performance of students in their concentration discipline did not always produce the expected results. Performance variation reflects differences in student quality, curriculum, and faculty grading policies.

Introduction

The purpose of this paper is to illustrate how a college can use the MFT in Business (MFTB) to analyze curriculum and grading policies to enhance its assessment efforts and to improve student learning. The focus of this study is to show a method or process for program assessment and possible “loop closing”.

The Major Field Test in Business (MFTB) is sponsored by Higher Education Assessment of the Educational Testing Service (ETS) and covers foundation course content taught in a typical undergraduate business program. Its multiple-choice questions cover topics in nine subject areas: accounting, economics, management, quantitative business analysis, information systems, finance, marketing, legal and social environment, and international issues. Rotondo (2005) presents a thorough summary of the advantages and disadvantages of the use of the MFTB for assessment.

At this university, the MFTB has been used as an assessment tool in the fall and spring semesters since 1998. The MFTB is included for assessment purposes because it provides an opportunity for the comparison of student performance at the university with students at other universities, as well as comparing this university's students over time. (Other assessment methods are used to measure specific learning goals.)

During a recent semester, the business school requested MFTB scores for subgroups of students to enhance the scope of potential analysis of the MFTB. The subgroups obtained were the students in each business concentration: accounting, economics, general business, management and marketing. This additional reporting allows for many new comparisons among students, curricula, and faculty teaching in each concentration.

The MFTB is the impetus for an expanding body of research among business school faculty. Given the current emphasis on assessment and improvement by AACSB, this surge in research is not surprising. In a 2006 survey of business school deans, Martell (2007) found that 46 percent of the deans surveyed reported that the Educational Testing Service's Major Field Tests were a component of their schools' overall assessment programs, and, according to the ETS website, 259 institutions with undergraduate programs in business administered the MFTB to senior students from September 2010 until March 2011 (ets.org, 2011). Many institutions perceive the MFTB as a way for institutions to benchmark other programs, as well as their own programs over time, by using a standardized testing instrument of known validity and reliability (Mirchandani, et al. (2001)). The ultimate goal is to improve the quality of business programs.

A number of studies consider possible factors that may affect MFTB performance including student major, SAT scores, age, gender, race, undergraduate GPA, business course GPA, and individual student motivation among others. Significant correlations between business GPA, overall GPA, SAT scores, both verbal and math, and student motivation were reported by Bycio and Allen (2007). The gender of a student, evidence that the student had taken the SAT, and the student's past academic performance as measured by grades were cited as predictors of student MFTB performance by Bagamery, et al. (2005).

In one of the most recent studies, Contreras, Badau, Chien and Adrian (2011) studied longitudinal trends as well as cross-sectional differences among student cohorts

to whom the MFTB was administered. They found that older students and male students scored higher on the MFTB, as did older students and male students in both the accounting and marketing cohorts. Among all business students, students of different majors also performed differently, with accounting, marketing and management majors' scores being negatively correlated with MFTB scores. Student cohorts with different academic backgrounds (GPA or ACT taken) also scored differently, with other standardized test scores being positively correlated to the MFTB among all business students as well as the various business major cohorts.

Other authors have also addressed the notion of "value added" for students by using the MFTB score as a proxy measure. Rook and Tanyel (2009) conducted a matched-pair study and found that, on average, MFTB scores rise about 14 points and student score percentiles improve about 31 points after completing the business core cores. Various hurdles to using the MFTB, such as a pre/post- test measure of "value added," were cited, including both the actual and opportunity costs of the MFTB.

Now we will turn to the methods of analysis of the MFTB and the results for this university are presented. This will be followed by a discussion of the results and the actions taken by this business program. Last to be addressed will be the authors' conclusions.

Methods

This small, public university's business program enrolls about 800 business students. Annually, it awards approximately 170 Bachelor of Science degrees in Business Administration. Each business student completes general education courses, a business core of 13 courses, and a business concentration of seven courses. The required business core courses are Financial Accounting, Managerial Accounting, Principles of Macroeconomics, Principles of Microeconomics, Probability and Statistics, Statistical Inference, Introduction to Business Information Systems, Legal Environment of Business, Principles of Marketing, Business Finance, Organizational Management and Behavior, Operations Management, and Business Policy. The student may choose a concentration in accounting, economics, general business, management, or marketing.

For a recent semester, the business school requested MFTB scores by concentration. This additional reporting allows for many new comparisons among students, curricula, and faculty for the concentrations. The process presented in this paper considers the following questions:

- How does the overall score differ by concentrations, and are the differences significant?
- How does the overall score compare with previous semesters?
- How does test subject area performance differ from previous semesters?
- How does test subject area performance differ by student concentration?

- How do students perform in their “own” subject area? For example, how do accounting concentration students perform in the accounting subject area?

The answers to these questions will likely highlight issues that warrant further analysis in the future. Additional analysis may focus on particular test subject areas or student concentrations. The MFTB results should be supplemented with curriculum information, student quality data, and perceived faculty performance differences. Grade distributions may reveal differences in course rigor among faculty and disciplines.

The following describes the specific results for this institution and is presented as an example of the process or method of using the MFTB student concentration information supplemented by grade distributions to make changes to the business curriculum. These changes are summarized at the end of the discussion and represent “loop-closings” in the assessment process.

Results

Major Field Test Scores

The ETS website provides comparative data for the MFTB. The institutional means total score distribution table and the institutional assessment indicator mean score distribution table convert the raw scores to percentiles. The reporting of percentiles makes it possible to compare school performance with all other domestic schools administering the MTFB. In Table 1 below, the MFTB results by percentile are presented for a small AACSB International accredited business college during a recent semester. Eighty-seven students with concentrations in accounting, economics, management, marketing or general business took this test. MFTB percentiles for the overall test score and the scores for the nine test subject areas (assessment indicators) for all 87 students are in column seven of Table 1. For the semester reported on, the business college requested the test results by student concentration (columns two through six in Table 1).

Table One

Percentiles for MFTB performance overall and test area scores by concentration

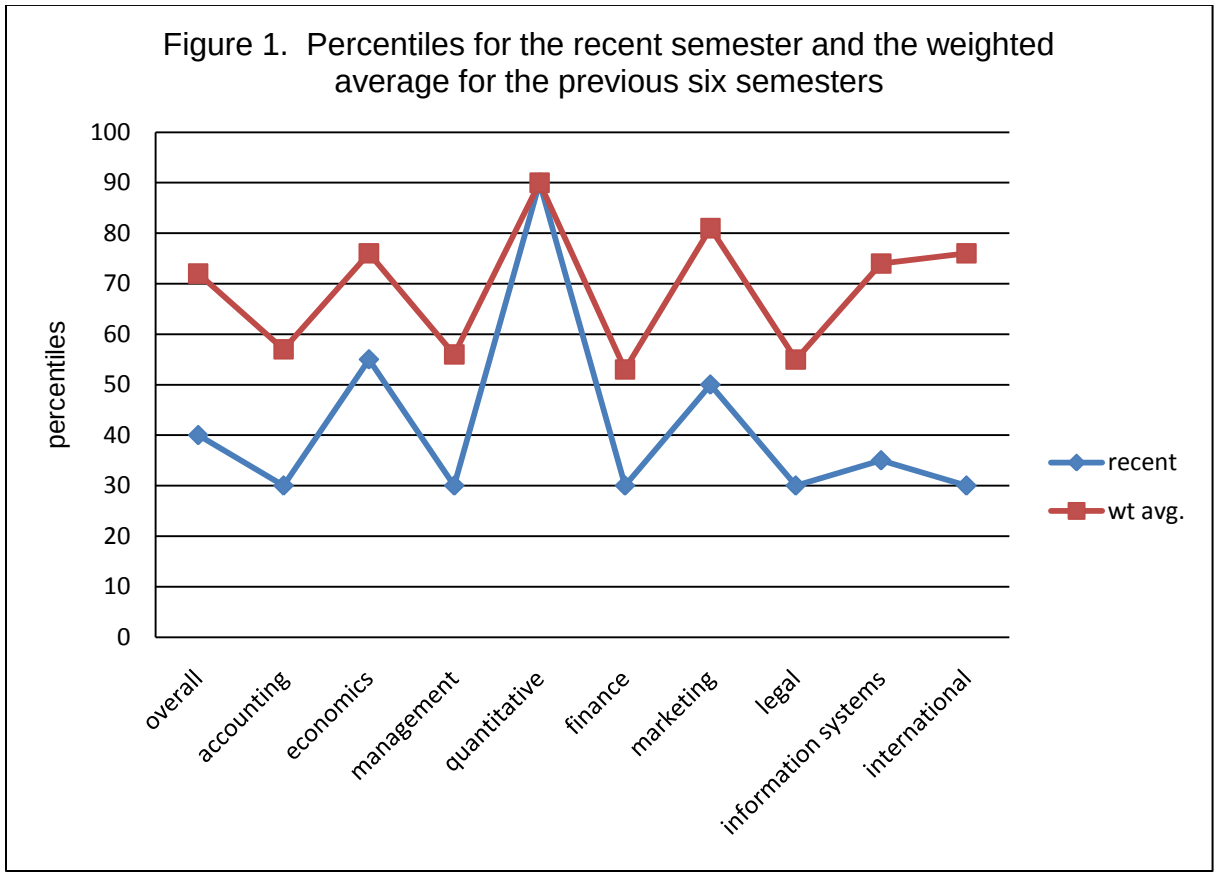
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Accounting	Economics	Management	Marketing	General Business	All Students
sample size	15	9	18	22	23	87
	Percent at or below	Percent at or below	Percent at or below	Percent at or below	Percent at or below	Percent at or below
Overall test score	70%	90%	20%	20%	50%	40%
Test subject areas						
Accounting	80%	30%	20%	15%	35%	30%
Economics	60%	95%	10%	35%	55%	55%
Management	65%	65%	15%	5%	45%	30%
Quantitative Analysis	95%	95%	55%	80%	95%	90%
Finance	70%	95%	15%	10%	30%	30%
Marketing	50%	95%	35%	55%	25%	50%
Legal and Social Issues	35%	65%	5%	15%	70%	30%
Information Systems	40%	40%	50%	15%	40%	35%
International Issues	40%	95%	15%	10%	20%	30%

The overall test score for the 87 students was the 40th percentile (40 percent of the institutional means were at or below the mean score for this group). This score was well below the previous semester score of 65th percentile. The drop in overall test score prompted further study. By concentration, the overall scores ranged from 90th percentile for economics students to 20th percentile for management and marketing students. The overall test score mean was 151. The test score means for the concentrations ranged from 147 to 162. Single factor analysis of variance revealed significant differences among the concentration means (p value = .007). Given that all business students take the same business core courses, the variation in overall test scores by concentration most likely reflects variation in student quality.

For all the students sampled, the percentile scores by test subject area ranged from 90 percent in quantitative analysis to 30 percent for five other areas. There were

three test areas (quantitative analysis, economics, and marketing) where the student percentile scores were 50 percent or better. Students scored at the 35th percentile in information systems and at the 30th percentile in accounting, management, finance, legal and social issues, and international issues. Figure 1 below shows the percentile score for the overall test and test areas for the recent semester and the weighted average of past performance for the previous six semesters. The relative performance in the test areas for this recent semester is consistent with past performance. Typically lower percentile scores occur in the areas of finance, legal and social issues, management and accounting.

Figure 1. Percentiles for the recent semester and the weighted average for the previous six semesters



By test subject area, the ranges were: Accounting performance ranged from 80 percent for accounting students to 15 percent for marketing students. Economics performance ranged from 95 percent for economics students to 10 percent for management students. Management performance ranged from 65 percent for accounting and economics students to 5 percent for marketing students. Quantitative analysis performance ranged from 95 percent for accounting, economics, and general business students to 55 percent for management students. Finance performance ranged from 95 percent for economics students to 10 percent for marketing students. Marketing performance ranged from 95 percent for economics students to 25 percent for general business students. Legal and social issues performance ranged from 70 percent for general business students to 5 percent for management students.

Information systems performance ranged from 50 percent for management students to 15 percent for marketing students. International issues performance ranged from 95 percent for economics students to 10 percent for marketing students.

There are several possible explanations of this wide variation in student performance. The variation may be due to variation in student quality, variation in grading policies, or business curriculum misalignment with the MFTB either in course content or course selection or both.

The range of scores was also quite wide by student performance in only their concentration area. General business is not a part of this finding because this concentration is a combination of courses from the other four concentrations. For this measure, economics students scored at the 95th percentile in economics; accounting students scored at the 80th percentile in accounting; marketing students scored at the 55th percentile in marketing and management students scored at the 15th percentile in management. Students take up to seven additional courses in their concentration areas to satisfy concentration degree requirements. Thus the expectation is that students will perform better in their concentration area than other business students.

Discussion

The following discussion highlights concerns raised by the above analysis of this data. The results will, of course, vary for different business schools. Here the intent is to focus on issues that may be addressed by changes in the curriculum or policies.

Management

Accounting, economics, and general business students performed better in the management area than did management and marketing students. Management students take significantly more management courses than other do students in other concentrations. In order to analyze the unexpected result that management majors only scored 15 percent in management, the following observations were considered. Accounting, economics, and general business majors scored 65 percent, 65 percent, and 45 percent, respectively, in management. They take significantly fewer management courses in their programs than do management majors. One possible explanation for the higher scores in management by these other three student groups is the fact that their overall performance on the MFTB ranged from 90 percent for economics majors to 50 percent for general business majors, while the management students overall score on the MFTB was only 20 percent. But, marketing students also scored only 20 percent overall on the MFTB, and these marketing majors scored 55 percent in marketing. In addition, the management majors scored higher in marketing (35 percent) than they did in management (15 percent). Across the entire MFTB, management students did better than marketing students in five areas (accounting, management, finance, information systems, and international issues), while marketing students did better than management students in four areas (economics, quantitative analysis, marketing, and legal and social issues). This suggests that additional upper

level management courses do not enhance MFTB performance for management students. Given the above observations, it is quite possible that the management curriculum at this school is not well aligned with the MFTB.

International Issues

Typically students at this college have performed well in the international area of the test (weighted average is 76th percentile). Each concentration has a required international course, but the course is not required before the student takes the MFTB. For this semester, the international percentile dropped to 30% and showed a wide variation across concentrations. Faculty recommended that the international course be taken before students take the MFTB. The international issues test area was one of the three areas on the MFTB where the results ranged from 95% to 10% for different student majors. In the other two areas, economics and finance, all students take basically the same courses with the same professors. In international issues, economics majors scored 95% while marketing majors scored only 10%. Economics students are required to take international economics and marketing students are required to take international marketing. One possibility for such a scoring range in this area is the possibility that the MFTB international questions are more aligned with the typical material covered in most international economics textbooks as opposed to international marketing textbooks. Another explanation could be that the economics students tested were just better students than their fellow students in marketing. Economics students scored 90% overall on the MFTB, while the marketing students scored only 20% overall.

Economics

The very low score (10 percent) for management students in economics suggests that these majors might benefit from a course like managerial economics that is required of general business majors, who scored 55 percent in economics.

Finance

As mentioned above, the finance area was one of the three areas where the student scores ranged from 95 percent to 10 percent. The students in management and marketing did poorly in this area with scores of 15 percent and 10 percent respectively. General business students, who are required to take cost accounting and managerial economics, did somewhat better at 30 percent. And, of course, accounting and economics majors took additional work in their respective areas that most likely enhanced their finance performance. Since this school has limited faculty resources in finance, one way to improve the finance performance of management and marketing students might be to have similar accounting and economics requirements as does the general business area.

Accounting

With the exception of accounting majors who scored 80 percent in accounting, no other student group scored above 35 percent. Of interest in the accounting area was the fact that general business majors scored 35 percent in accounting, while economics majors only scored 30 percent, and economics majors scored 90 percent overall on the MFTB, while general business majors scored 50 percent. The fundamental reason for this difference in accounting scores appears to be curriculum related. While both economics and general business majors are required to take the same two principles of accounting courses, only the general business students are required to take an upper division accounting course, cost accounting. In addition, the management and marketing majors are not required to take an upper division accounting course either.

Marketing

The lowest performers in the marketing area were general business and management students. General business students are required to take an additional 300-level marketing course before graduation; management students are only required to take the Principles of Marketing course, as are accounting and economics students.

Information Systems

In the information systems area, the controlling factor in student performance seemed to be directly related to how many students in each major area took an upper division course in management information systems. Marketing majors would most likely benefit from an additional course in this area.

Grade Distributions for Business Courses

In addition to curriculum design, faculty grading may contribute to how well students taking the MFTB perform. The expected result is that higher grades reflect more student knowledge and thus students earning the highest grades would perform better on the MFTB. Faculty grading policies may have negatively impacted the MFTB results; or, there might be an inverse relationship between student grades in discipline and student MFTB performance. Lenient grading may allow weaker students to continue in the program and may not measure student knowledge well. An initial review of students' final grades by concentration area indicated that students taking management and marketing courses were much more likely to be successful (C or better) than students taking other business courses.

Grade distribution information was collected for business courses for five semesters including the semester this study was conducted. Table 2 below includes the grade point averages (GPA) and DFW rates for core courses (200 and 300-level) and upper division concentration courses. The DFW rate is the percentage of enrolled students earning a D+, D, F or W. A grade of W indicates the student withdrew from the course, usually for poor performance. The GPA for upper level management courses is 2.98 with a DFW percent of 8 percent. The GPA for upper level marketing courses is

2.84 with a DFW rate of 8 percent. Both of these GPAs are higher and the DFW rates are lower than the other two concentrations. A single factor analysis of variance of the section GPAs for the upper level courses in the four concentration areas showed a significant difference in mean concentration GPAs (p = .0004). The students majoring in management and marketing only scored 20 percent on the MFTB, while accounting and economics majors scored 70 percent and 90 percent respectively. Thus the expected results of higher grades leading to higher MFTB performance is not observed for upper level management and marketing courses.

Table 2

GPA and DWF percent for five semesters of core business courses and upper level concentration courses

	n	GPA	%DFW
200-level core courses			
Economics—2 semesters	963	1.99	52%
Accounting –2 semesters	915	2.06	50%
Information Technology	719	2.49	27%
Statistics –2 semesters	818	2.28	35%
300-level core courses			
Legal Environment of Business	569	2.67	16%
Principles of Marketing	714	2.83	13%
Business Finance	492	2.55	19%
Organizational Management & Behavior	739	2.91	11%
Operations Management	487	2.62	15%
Upper level concentration courses			
Accounting	721	2.52	24%
Economics and finance	735	2.63	21%
Marketing	671	2.84	8%
Management	1428	2.98	8%

In addition to examining grade distributions, in general, a comparison was made of the final student grades in international economics and international marketing courses for the semester of the test results and the previous semester. This data is shown below in Table 3.

Table 3

Grade distribution for two international courses for two semesters

	A	B+	B	C+	C	D+	D	F	W	total	%DFW	Avg.
International Economics	7	5	14	5	14	4	1	10	8	68	34 %	2.25
International Marketing	8	16	26	17	24	0	1	1	0	93	2 %	2.77

Like in the management area, where higher students grades might have contributed to lower management MFTB results (15 percent), for management majors, higher student grades in international marketing might have contributed to lower international issues test results (10 percent) for marketing majors.

In order to investigate further the possibility of an inverse relationship between student grades in a discipline and MFTB performance, a transcript analysis was conducted for the 11 lowest scoring students on the MFTB (approximately the 15th percentile) to determine how they performed, as measured by final grade, in the junior level business courses required of all students. Of interest was how many of these students had to repeat any of these courses. Most of these students took these courses within a two-year window before taking the MFTB. Table 4 below illustrates the results.

Table 4

Number of the lowest performers who repeat 300-level core courses

Course	Repeat	Do not repeat	Total number of students
Legal Environment of Business	3	8	11
Principles of Marketing	3	8	11
Business Finance	5	6	11
Organizational Management & Behavior	0	11	11
Operations Management	1	10	11
Total	12	43	55

Three students had to repeat Legal Environment of Business and Principles of Marketing. Five students had to repeat Business Finance. One student had to repeat Operations Management, but none of these students had to repeat Organizational Management and Behavior. Or, only one time out of 22 tries did one of these students have to repeat one of these two management courses, while there were 11 required repeats out of 33 tries in the three other junior level courses. Once again it appears that

grading policies in management might be negatively affecting MFTB student performance in management.

Actions Taken and Concluding Remarks

This business faculty has collected MFTB data for many years and there have been curriculum changes in the past. Attention has typically been on courses that all business students take (the business core). These test results were the first time the business school had information on test areas for each of the concentrations. This allowed for discussions of possible ways to change concentration requirements and electives to improve student performance on the MFTB in general and in specific test areas.

Based on the results there were several recommendations made to business faculty.

- Make the required international course be completed before the student takes the MFTB.
- Consider requiring an additional accounting course for economics, management, and marketing majors.
- Consider requiring managerial economics for management majors.
- Consider requiring additional information systems work across the concentrations.
- Have management faculty determine if the management concentration should be adjusted to align better with the MFTB.
- Consider a reevaluation of faculty grading policies given the differential performance of our students.

In response to the recommendations, the business faculty approved the prerequisite changes necessary to ensure students had completed the required international course before taking the MFTB. The economics faculty changed the economics concentration to require the completion of an upper level accounting course (cost accounting). The management faculty changed the management concentration to require an upper level information systems course and to require management students to complete either an upper level course in accounting (cost accounting) or economics (managerial economics). There were discussions concerning grading policies and an increased awareness of the differences, but there were no formal proposals.

In general, the analysis of the MFTB by concentration and examination of grading differences were useful assessment discussions for the college. Curriculum changes were made and the effects will be judged by later MFTB tests. Further research will indicate if the same problems persist or if new challenges emerge.

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