Major Field Test: An Assessment Tool Used For Program Learning Outcome Measurement

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Abstract

Proficient accreditation of academic programs is envisioned to indorse the forte of the education students get. Direct and indirect assessment techniques are being assimilated to weigh the quality of teaching and learning. The direct assessment approach emphases on teachers' analysis of student's works, course evaluation, portfolios, standardized exit tests, etc. Indirect assessment on the other hand focuses on survey types of assessments on student's learning in an attempt to improve the quality of teaching and learning. This paper confers about the standardized test used in measuring the student learning outcome in the computer science program. An analysis of the test outcome is also offered.

Keywords: accreditation; computer science; major field test

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1 Introduction

Assessment is an unambiguous commitment of modern academic programs. Accreditation canons need evidence-based reporting linked to assessment and a demonstration that assessment outcomes are used for continual enhancement. It hassles continuous data collection, its analysis and continuously making conclusion about the efficacy of the system. Institutions are progressively called on to supply evidence that their educational mission is being achieved. Innumerable measurements are used to evaluate the program efficacy. One among them, commercially established Major Field tests are used to determine the level of learning that students have acquired in specific fields of study. Major Field tests (MFT) are widely used and assist departments in determining programmatic strengths and weaknesses when compared to other programs. MFT data will be compiled and analyzed. These results will be useful for the faculty to make the programmatic enhancements. Major Field test is being administered at our college for the undergraduate students and an analysis of the results of computer science major field test is presented in this paper.

2 Background

In 2004, the Bachelor degree program in Computer Science offered by Modern College of Business and Science (MCBS) was provisionally accredited by the accreditation council of the sultanate of Oman. MCBS received few acclamations for corrective action in the panel's programmatic report. One of the recommendations was to develop a systematic process for measuring and validating the program and course objectives.

Based on the feedback received from the accreditation visit, the Department of Computer Science has decided to develop a systematic method for course and program assessment.   As MCBS is affiliated to University of Missouri-St. Louis (UMSL) which follows the Accreditation Board for Engineering and Technology (ABET) model, the department decided to follow the ABET model for its program assessment. The ABET Computing Accreditation Commission accrediting criteria require that programs define measurable objectives and must periodically collect

data that indicate the extent to which these objectives are being met; They must use the analysis of that data to identify ways the programs can be improved [1].

Program assessment is demarcated as the systematic and continuous method of collecting, analyzing and using information from various sources about a program and measuring program outcomes in order to improve student learning. This is accomplished through obtaining a good understanding of what the program's graduates know, what they can do with this knowledge, and what they value as a result of this knowledge [2].

Towards this, the first step was to revise the program mission statement and program objectives. Next the program outcomes were well-defined to match the ABET criteria along with the local market demands. The department advanced the course objectives for each courses in the major and mapped the course objectives to program objectives.

In order to state continuous quality improvement at program level, MCBS applied direct and indirect assessments of student learning. The direct assessment approach emphases on teachers' analysis of student's works (such as exams, labs, projects, and assignments), capstone course evaluation, portfolios, standardized exit tests, etc. Even with the limitations, Mirchandani, Lynch, and Hamilton [3] conclude that standardized exams are attractive vehicles for program assessment.

Indirect assessment on the other hand focuses on survey types of assessments on student's learning in an attempt to improve the quality of teaching and learning. Indirect assessment instruments include exit surveys, course evaluation surveys, industry feedbacks, etc.

Homogenous tests as a method for outcome assessment are widely used, especially when external validity is a concern. Every program has a traditional way of measuring learning outcomes from its content related knowledge. Standardized exit tests are associated with the intellectual goals of these programs. These goals are based on the general body of knowledge in each program.

Two types of exit tests are widely used; 1) commercially produced standardized tests (CPST) and 2) locally developed by faculty/local experts. CPST are developed based on international standards. The international criteria are also being covered by its measurements. These tests are measuring students' learning level on a global scale in a specific field of study.

Tests developed by the university/college have its own advantages. These evaluating methods are more general and using widely over the world. Since the educators are designing the outcomes, the assessments by them will be more appropriate. It will be cost effective and it has its own interpretational advantages. It can be assessed continuously and enhancement will be ongoing. These tests and assessments are more reliable and we can check the validity at any stage. Purpose and goal of each test must be recognized and documented before the implementation. All collegiate graduates programs are tasked with the ongoing need for assessment [4].

MCBS is prevailing the MFT for both business and computer science program. In the beginning, the commercially available tests were conducted and later adopted the locally developed test due to reasons beyond our control.

3   Results and discussions

An analysis of results of Major Field Tests conducted in the first 3 years is presented here The ETS Major Field Test for Computer Science consists of multiple-choice questions, some of which are grouped in sets and based on materials such as diagrams, graphs and program fragments. The assessment indicators are:

1. Programming Fundamentals

2. Computer Organization / Architecture / Operating System

3. Algorithms / Theory / Computational Mathematics

Table 1: % of outcomes in each Assessment Indicator

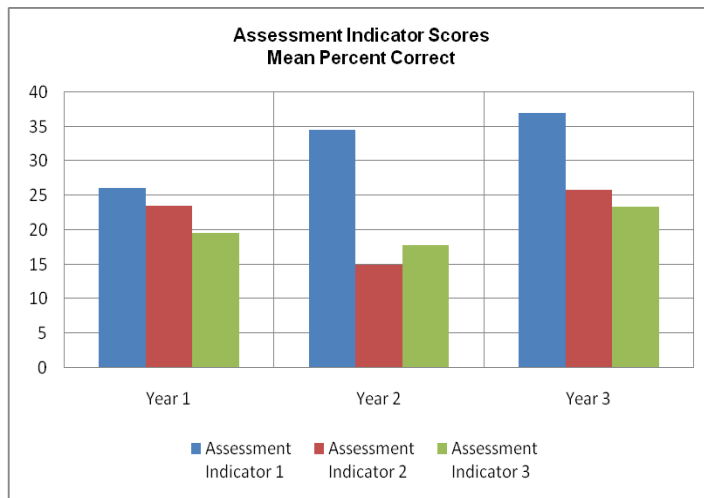|	% of outcomes	Mean Percent Correct		
		Year 1	Year 2	Year 3
Assessment Indicator 1	15.4	26.1	34.5	37
Assessment Indicator 2	23.1	23.6	14.9	25.9
Assessment Indicator 3	30.1	19.6	17.8	23.4

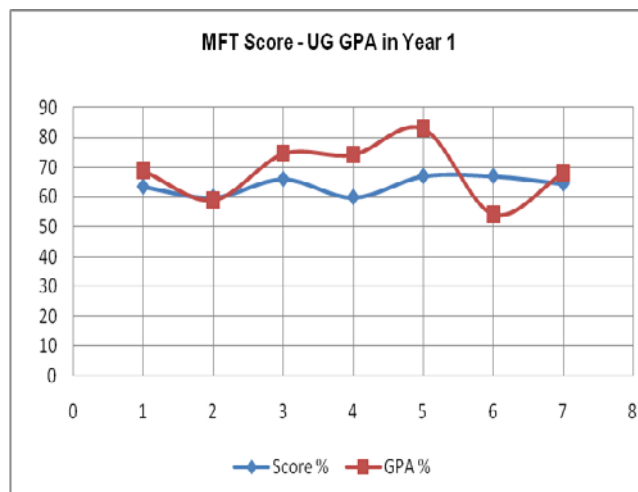Figure 1: Assessment indicator Scores

Figure 2: MFT Score Year 1

The MFT covers about 70% of Computer Science undergraduate program outcomes. Table 1 gives the percentage of outcomes in each assessment indicator and Mean percentage Scores of Assessment indicators in each year. Figure 1 gives the comparative analysis for the Year1, Year 2 and Year 3.
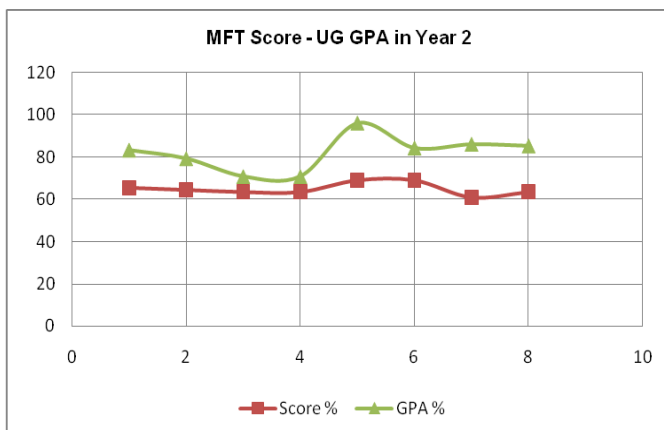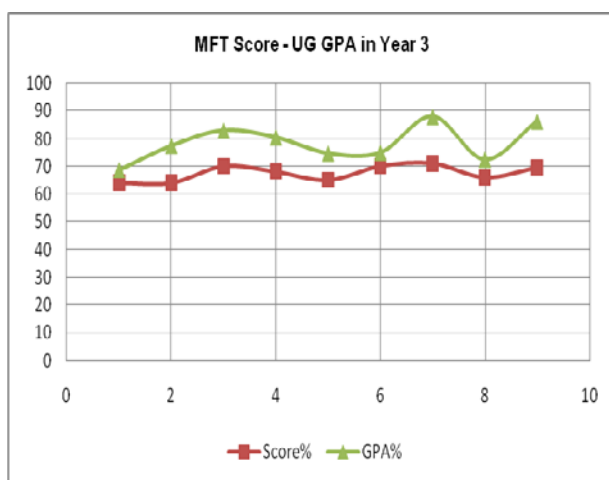
Figure 3: MFT Score Year 2

Figure 4: MFT Score Year 3

We analyze the MFT Score of each student in the program with undergraduate GPA (UG GPA) for the year 1, year 2 and year 3. Figure 2, Figure 3 and Figure 4 explain the relation between the two scores and we found that in all these years they are correlated.

Figure 5 recites Mean MFT Score of all students appeared with the Mean UG GPA of the Batch. This data describes that both the scores are almost similar. But we found a slight advantage in the UG GPA as comparing with the international test.
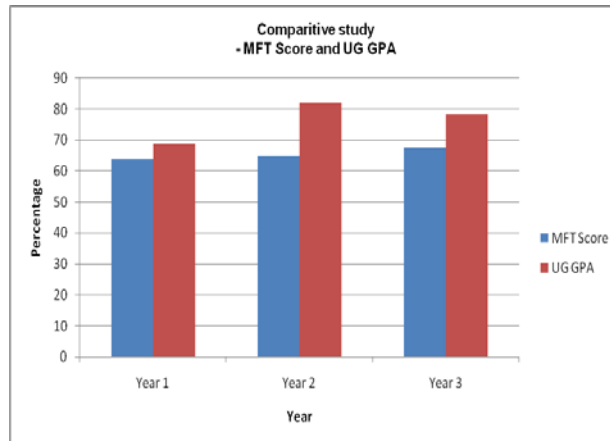
Figure 5: Comparative Study of MFT Score and UG GPA

Based on the analysis of the major field tests, appropriate amendments have done in the core curricula. In order to take the exam seriously by the students, it is integrated into the capstone course and all the students must appear for the major field test as a part of the capstone course requirement.

4 Pros and cons of the major field test

The MFT exam can be implemented quickly without the need for time-consuming department efforts to develop and validate a local exam because ETS provides the exam as well as the administration procedures, the grading and the results [3]. Each program is able to compare its results to with other college taking the exam. Also the exam's content, with questions written by subject area experts and updated regularly, can be used as a benchmark for curriculum. Consistent with Mirchandani[4], overall GPA has a strong internal validity and provides a measure of student performance related to the curriculum of the institution.

Despite its popularity in outcomes assessment programs, the ETS Major Field Test is problematic in a variety of ways, most importantly that it may not accurately measure student learning. Also, its results don't provide sufficiently detailed results to allow department to pinpoint specific problems. Moreover, the program core may vary from college to college and a single exam may not cover all of them exactly.

5 Conclusion

This paper convenes the role of MFT in assessing the student learning outcomes at MCBS. This paper also concealments how the test score is appraised and utilized in the program appraisal and actions taken for addressing the identified weaknesses of the programs. GPA as a motivating factor is an important consideration for Computer Science programs attempting to find ways to enhance program quality as a form of direct assessment.

Homogeneous tests have been criticized, too. Despite its popularity the Major Field Test is problematic in a variety of critical ways. Locally-developed tests are directly linked to local curriculum and can ascertain student performance more accurately. For the preceding few years, MCBS depends on locally developed test for numerous reasons.

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