

**STEP TOWARDS GLOBALIZATION OF MATHEMATICS
PLACEMENT PROCEDURE**

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One of the most frustrating and time-consuming tasks facing many colleges and universities in this nation is the accurate placement of incoming students into mathematics classes. Every institution has some method of placement, ranging from algorithms utilizing SAT and/or high school class rank to placement tests developed at the individual institution. One problem with this approach is that the schools are not agreeing on a standard set of skills that each student should possess in order to be placed in, for example, Precalculus versus Calculus. One question every department or institution wrestles with is how comparable their placement procedure is to other institutions.

We first recognized this problem fifteen years ago, and developed a short, simple placement test to quickly and efficiently place students into the most appropriate class. We compared it with the more resource-intensive placement process in use before, which utilized high school course work and SAT test scores. The development and testing of this placement test took place at Millersville University in Millersville, Pennsylvania beginning in 1994, under the sponsorship of the Dean of the College of Arts and Sciences, and involved over 12,000 students.

While other placement tests have long been available, our test improves on them by being simple, short, easy to administer, free, easily adapted to varying student populations and the institution needs, and can be administered via a web-based interface or, for institutions without a strong technology presence, via traditional testing methods. We were particularly pleased that this test accurately placed new entering students regardless of their major or eventual career goals, and were curious as to how universal this test might be. Upon further testing with different student populations and in different institutions, we found it to be accurate with multicultural students, with engineering students (Millersville University does not have engineering departments), and nontraditional, returning students.

The next step was to make this test freely available to other schools, in order to help them place their own students as well as collect data to compare between schools. The most efficient, cheapest, and readily available method was to make it available over the Internet, using standard web-browsers. This reduces the cost overhead for institutions, the test itself is free, and no extra expense is required. Since one of the goals is to allow

one institution to compare itself with another, or one instructor to compare his or her class with another class or another institution, we developed a central database where users can log-in, take the test, and their results are collected in our central system. The results are available to all users, thus meeting our goal of allowing comparison of placement tests between institutions.

1. Description of Innovation

Rationale: To develop a simple, accurate placement test that works across all student populations, allows comparison among institutions, is free, easily accessible, and allows for later statistical analysis.

Duration of Project: Ongoing. Begun 11 years ago, anticipated availability school year 2006-2007.

Collaboration by other Colleges and Universities: The original test was developed at Millersville University, and continued development is expected at Embry-Riddle Aeronautical University.

2. Innovativeness and Effectiveness

Our placement test consists of 18 questions, with a time limit of 10 minutes. A similar but different set of 18 questions are generated by the program for each test. Of the students who score 14 or above, 90% will be expected to succeed at Calculus I. Of the students who score 4 or below, 90% will be expected not to have a success in College Algebra course. Of the students who score from 9-11 on the test, the test is less accurate at predicting success in Precalculus/Calculus I. For these students, a second, 20 minute test is available that will more accurately pinpoint their strengths and weaknesses, and funnel them towards the appropriate class.

Our test is innovative due to it's ease of administration, that it utilizes a web-based media, that it can be tailored to meet an individual institution's or instructor's needs, and it can be administered via pencil and paper for less technologically-advanced institutions. One feature we want to emphasize is the collection of data from each user, and the aggregation and analysis of the data that allows for the comparison of individuals, classes, departments, or institutions.

3. Role of Technology

We are particularly proud of how the technology that delivers this innovation is virtually invisible to the end user. The benefit of this is that anyone who can access the Internet and open a web browser can use this test. Our program takes advantage of the standardized operating systems and software that are universally available. However, the back-end of the program, which compiles the data from the institutions is a proprietary program that can be modified by interested end-users for data analysis and program improvement. This is only available to researchers who are interested in the more technical aspects of the program, and is completely transparent to our targeted end-user.

4. Past Funding

This project was funded by three separate grants from the Dean of the College of Arts and Sciences of Millersville University. The majority of programming time was

unfunded, as the principal investigator worked on his own time in order to facilitate this project.