

# Assessment of Mathematics Programs to Prepare Future Teachers

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One of the driving forces behind the growing interest in assessment is the increased emphasis on accountability in education as a national issue. Programs offering initial certification of teachers were among the first to face this challenge. In fact, as education remains a popular political topic, the pressure on such programs grows and changes in ways that can make the required assessment seem more of a hurdle than an opportunity.

Although state boards of education maintain primary control over the higher education programs that prepare teachers, national accrediting bodies have an increasing influence over state guidelines. The National Council for Accreditation of Teacher Education (NCATE), one of the most respected and influential accrediting agencies, asserts in its mission statement that “through standards that focus on systematic assessment and performance based learning, NCATE encourages accredited institutions to engage in continuous improvement based on accurate and consistent data” (NCATE 2002).

One of the six standards that determine if an institution is compliant with NCATE professional expectations concerns assessment: “The unit has an assessment system that collects and analyzes data on the applicant qualifications, candidate and graduate performance, and unit operations to evaluate and improve the unit and its programs.” In explaining how this standard will be evaluated, NCATE documents make it clear that this standard must be taken very seriously, prescribing the criteria for developing an assessment system, quantifying expectations of data collection, analysis and evaluation, and emphasizing the use of data for program improvement. All states have by now issued an assessment mandate for programs that prepare teachers; many states have taken NCATE as the model on which state accreditation is based.

The federal government has also contributed to the pressure on teacher education programs. In the wake of the passage of the *No Child Left Behind Act of 2001*, the United States Department of Education challenged the traditional methods of preparing teachers. At the first annual Teacher Quality Evaluation Conference in June 2002, Secretary of Education Rod Paige released a report with data showing that state certification systems “allow into the classroom too many teachers who lack solid content knowledge of the subjects they will teach.” To raise academic standards, the report calls on states “to require prospective teachers to pass rigorous exams in the subjects they plan to teach” and calls on states and institutions of higher education “to revamp their teacher preparation programs and eliminate many of the rigid certification requirements, such as the massive number of methods courses” (US Dept. of Ed., 2002).

Subsequent reports have suggested that alternate paths to certification may be more effective and have called for the creation of a clearinghouse “to identify research-based best practices in relation to ... teacher training and teaching in subject areas” (US Dept. of Ed., 2003).

Given the reality of these pressures, it is safe to assume that all programs involved in teacher certification have some form of assessment measures in place. In many cases, these assessments have been created to satisfy the external requirement and to prove that the program is adequate. In general, program directors do not expect or desire to collect data that will suggest that they change their practice. While assessment measures created in such a climate are not useless, they do not have the potential for creating meaningful conversations and rich learnings that are possible with different approaches. In contrast, the case studies in this section provide examples of institutions that have responded to the national pressure in ways that provide both useful information about their programs and suggestions for ways in which these programs can improve.

One institution, Monmouth University, is establishing a graduate program targeted for two populations simultaneously—middle school teachers who do not have mathematics certification and adults changing careers to become mathematics teachers. The program is an interesting design as the two populations for which it is aimed are not similar in preparation or experience. At Monmouth, the assessment plan is being developed along with the program. Although the concept of developing a program with its assessment plan is not innovative, it is surprising how seldom concurrent development is seen. Gold’s description of the findings from the assessment in the early days of the program and the modifications both to the program and to the assessment plan illustrate the profound impact assessment can have in the creation of a program. By using formative and summative assessment measures, Gold has gathered useful data which has shaped the educational experiences that will be provided to the two disparate target populations in the program.

A second institution, University of Texas at Brownsville and Texas Southmost College, has taken one of the stickier assessment issues and turned it into a truly useful tool. The State Board for Educator Certification (SBEC) in Texas administers a state exam, ExCET, to all candidates for certification. The SBEC uses the first year pass rate and the cumulative pass rate over a two-year period to determine when a program will be rated “accredited,” “accredited under review,” or “not accredited.” For institutions in states other than Texas, a similar ranking is done by the “National Report Card” using the results of the PRAXIS II exams. Of course, this kind of published ranking concerns administra-

tors at institutions and usually results in pressure to improve pass rates on the tests. Security concerns meant that the university was not allowed to receive a detailed analysis of the performance of their students on the ExCET, nor were they allowed to see a copy of the exam. They did, however, have access to the ExCET practice test, a test strongly correlated with the ExCET. So the mathematics department adopted the ExCET practice test as a mathematics benchmark exam, administered it to all majors, and used the resulting data to provide tutorials for students in specific areas and to improve course offerings in the department.

The implications for the use of this kind of assessment tool are tremendous and the process is certainly replicable at campuses in other states with other external exams. The important ingredient is access to a sample test that is highly correlated with the national exam. In fact, it seems a logical next step for some of the external producers of exams to begin to provide the relevant information to institutions from the exams themselves. The authors of the UT Brownsville case study enumerate several advantages of using the sample test:

- the test was free to students;
- the test was graded and analyzed by departmental faculty; and
- the students wanted to do well on the test because of the high stakes of the ExCET exam that would follow.

A direct consequence of implementing this assessment was improvement in the measured pass rates. However, the specific data on the kinds of problems students consistently had on the test and the kinds of changes in coursework for the students that might be implicated is potentially even more powerful. The case study concludes before the effects of curriculum changes can be measured.

These case studies provide a creative alternative to the assessment cycle for teacher education, using data to suggest meaningful improvement. Although most programs expect to collect data that confirms their current practice, even excellent programs have the potential to be better. Designing assessment most likely to suggest areas where improvement is appropriate ensures that programs continue to get better over time. Student learning ultimately is the beneficiary of this approach.

## References

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