

Making an Informed Decision about Formative Assessment Developmental Mathematics

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Incentive

Strengthening Mathematics Skills at the Postsecondary Level: Literature Review and Analysis – The CNA Corporation

Research into instructional practices and curriculum content methodologies that are specific to developmental mathematics is largely flawed, lacking in the scientific rigor necessary to make sound inferences.

Areas of Investigation

- Research
- Professional Organizations
- Best Practices
- Resources
- Institutions

Research

- Math Teachers Encouraged to Assess Creatively – Cavanagh, Sean
- Learning for Understanding: A Faculty-Driven Paradigm Shift in Learning, Imaginative Teaching, and Creative Assessment – Diaz-Lefebvre, Rene

Research

- Minute Math: An Action Research Study of Student Self-Assessment – Brookhart, Susan M.; Andolina, Marissa; Zuza, Mehan; Furman, Rosalie
- Innovative Assessment in Higher Education – Bryan, Cordelia; Clegg, Karen

Professional Organizations Standards

AMATYC

- Assessment is an on-going activity that leads to improvement in student learning by providing data necessary for making informed decisions at the class, course, and program levels

Professional Organizations Standards

AMATYC

- Assessment Implementation Cycle
 1. Define/Refine student learning outcomes based on input from stakeholders
 2. Design assessment tools, criteria, and standards directly linked to each outcome

Professional Organizations Standards

AMATYC

- Assessment Implementation Cycle
 3. Implement assessment tool(s) to gather evidence of student learning
 4. Analyze and evaluate the collected data

Professional Organizations Standards

AMATYC

- Assessment Implementation Cycle
 5. Identify gaps between desired and actual results
 6. Document results and outline needed changes in curriculum, instructional materials, or teaching strategies

Professional Organization Standards

MAA

assessment procedure – an explicit means for obtaining information on the program's impact on student development; evaluation of individual components as well as the program as a whole

Professional Organization Standards

MAA

- Assessment Cycle
 1. Articulate the learning goals of the mathematics curriculum and a set of objectives that should lead to the accomplishment of those goals
 2. Design strategies (e.g., curriculum and instructional methods) that will accomplish the objectives, taking into account student learning experiences and diverse learning styles, as well as research results on how students learn

Professional Organization Standards

MAA

- Assessment Cycle

3. Determine the areas of student activities and accomplishments in which quality will be judged. Select assessment methods designed to measure student progress toward completion of objectives and goals.

tests; surveys; evaluation reports; portfolios; essays; summary courses; oral presentations; dialogue with students

Professional Organization Standards

MAA

- Assessment Cycle
 4. Gather assessment data; summarize and interpret the results
 5. Use the results of the assessment to improve the mathematics major.

Professional Organization Stakeholders

- NADE
- CRLA
- NCTM

Best Practices

- Existing Best Practices lists
 - NADE
 - Association of College and Research Libraries

Best Practices

- Existing Best Practices lists
 - American Psychological Association
 - American Association for Higher Education
 - Educate America

Best Practices

- Existing Best Practices lists
 - American Psychological Association
 - Encourage department ownership to drive the process
 - Define your objectives in the context of your institutional mission
 - Focus on collaboration and teamwork
 - Clarify the purpose of assessment
 - Identify clear, measurable, and developmental student learning

Best Practices

- Existing Best Practices lists
 - American Psychological Association
 - Use multiple measures and sources consistent with resources
 - Implement continuous assessment with clear, manageable timelines
 - Help students succeed on assessment tasks
 - Interpret and use assessment results appropriately
 - Evaluate your assessment practices

Resources

- BlackBoard
- Course Compass (My MathLab)
- TRACS
- ALEKS
- EDUSPACE
- ModuMath
- Maple T.A.
- Scientific Notebook
- ThomsonNOW!
- EnableMath

Institutions

- Texas State University - San Marcos
- San Antonio College
- Austin Community College
- Florida Community College at Jacksonville

Summary

- No developmental mathematics-specific information exists about assessment
- Evidence indicates that formative assessment is traditional in the sense that it is answer-centered and not open-ended