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Research Brief

Grading Considerations in Mathematics Classrooms

Question: **What research is available on grading practices and policies in mathematics classrooms?**

Summary of Findings:

Little research is available specifically about grading practices in mathematics classrooms. However, there is research about grading practices in high schools, across content areas.

Since their first use students, parents and others have assumed that grades are reliable measures of student achievement. "In short, most Americans have a basic trust in the message that grades convey" (Marzano, 2000).

Many educational researchers are highly critical of traditional grading practices. They suggest that commonly used grading systems fail to accurately reflect what students know and are able to do. The criticisms contend that (a) teachers consider factors other than achievement when assigning grades; (b) teachers weigh factors differently, and (c) teachers misinterpret scores on many classroom assessments.

The Mid-Continent Regional Educational Laboratory (McREL) found that teachers, when assigning grades, frequently considered several "nonachievement" factors. For example, they reported that among the high school teachers in their study, 36% considered effort, 14% behavior, 9% cooperation and 24% attendance.

The same study also found that two teachers grading the same student would often assign starkly different grades. An Ohio study (Cicmanec, Johanson & Howley, 2001) found that mathematics teachers saw grades as a way to control students rather than measure achievement. In five studies of grades assigned by high school teachers McREL found the following:

Grade Level	Same Grade Given	1 Grade Different	2 Grades Different	3 Grades Different
9	45%	38%	11%	6%
9	53%	27%	14%	6%
9	74%	17%	9%	0%
11	47%	37%	15%	1%
12	55%	21%	21%	3%

This lack of consistency showed that the grade received by a student depends on many factors including their assigned teacher.

Guskey & Bailey (2001) identified six major purposes for grading. They include:

1. Communicating a student's achievement status;
2. Providing information that students can use for self-evaluation;
3. Selection, identification or grouping of students;
4. Providing incentives for students to learn;
5. Evaluating the effectiveness of instructional programs; and
6. Providing evidence of students' lack of effort or responsibility.

Changing grading systems can be controversial. Most school stakeholders assume that grades accurately portray student achievement. Because high school grades are one of the important factors used to predict performance in college (College Board, 1998) it is important that schools examine grading practices to assure that they are consistent and accurately reflect student learning.

Considerations When Modifying Grading Practices

In his comprehensive look at classroom grading Marzano (2000) suggests that schools should report both achievement and non-achievement factors. Most essential, however, is to separate the reporting and not mix the results into a single grade.

Marzano (2000) suggests the following strategies when thinking about revisions to grading practices and policies:

Obtain Agreement on Factors Used to Determine Grades – Principals should work with teachers to get agreement on the factors included in grades. This should also include specific content, thinking and reasoning skills as well as general communication skills.

Establish Specific, Challenging Achievement Targets – Be explicit about learning targets for students. Many schools develop rubrics for each target and provide students with data about their progress using the rubric.

Agree on the Weights to be Applied – After agreeing on the factors, agree on the weight given to each of the factors. While often difficult to discuss because of the vast differences among teachers, it is critical to reach agreement in order to provide greater consistency among teachers.

Change the Report Card – Implement a report card that provides overall grades as well as scores on individual standards. Another option would be for the report card to include two grades for each subject, one for academic content and the other for nonacademic factors. A third model might be a report card with only scores on individual standards and nonachievement factors.

Parent and Community Communication – It is important to recognize the need to engage parents and community in discussions about grading practices. Most people are only familiar with traditional grading systems. When designing new systems establish ways to communicate with parents and community, provide feedback loops, and include parents in all planning groups.

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Conclusion

Changing grading policies and practices often involves changing the culture of a school. Traditional grading practices are assumed to accurately convey information about student learning. Teachers, students, parents and community must be involved in discussions about changes for the changes to be successful and sustained long-term.

Print Resources:

Marzano, R. (2000). *Transforming classroom grading*. Alexandria, VA: Association for Supervision and Curriculum Development. (www.ascd.org)

Marzano, R., Pickering, D. & Pollock, J. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: Association for Supervision and Curriculum Development. (www.ascd.org)

Stiggins, R. (2001). *Student-Involved Classroom Assessment* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall.

Online Resources:

Standards and Benchmarks for Mathematics
http://www.mcrel.org/standards-benchmarks/docs/process-math.asp
This site provides detailed information about the current thinking on standards and benchmarks in mathematics.

Mathematics Resource Library
http://www.mcrel.org/lesson-plans/math/index.asp
This site at the Mid-Continental Research for Education and Learning Lab provides many resources and reports about sound instructional practices in mathematics.

What We Know About Mathematics Teaching and Learning
http://www.mcrel.org/topics/products/33/
This link provides access to information, updated in 2008, about best classroom practices in mathematics, K-12.

High School Grading Policies
http://professionals.collegeboard.com/data-reports-research/cb/high-school-grading-policies
This report from the College Board provides information about current grading practices in high schools.

Assessment and Grading in High School Mathematics Classrooms.

http://www.eric.ed.gov:80/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ543531&ERICExtSearch_SearchType_0=no&accno=EJ543531

This report examines assessment and grading practices in high school classrooms.

High School Mathematics Teachers: Grading Practices and Student Control

http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED453290&ERICExtSearch_SearchType_0=no&accno=ED453290

This study reports on grading practices among high school mathematics teaches in Ohio.

National Council of Teachers of Mathematics

www.nctm.org

The National Council of Teachers of Mathematics website provides many resources on research, best practice, and lessons.

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