

Reference Desk No. 400
Impact of Formative Assessment on Student Learning

Question:

1. What research exists showing the impact on the use of benchmark and formative assessments on student learning?
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Report:

Following an established REL-NEI Reference Desk research protocol, we conducted a search for research reports as well as descriptive and policy-oriented briefs and articles in this area. The sources included federally funded organizations, additional research institutions, several educational research databases, and a general Internet search using Google and other search engines. We also searched for appropriate organizations that may act as resources on this issue. We have not done an evaluation of these organizations or the resources themselves, but offer this list to you for your information only.

Our researchers found public articles on benchmark and formative assessment impact on student achievement. The Issues and Answers report from the Institute of Education Sciences is particularly notable, as it directly answers the question and is based on a program in Massachusetts, where the request originated.

Question:

1. **What research exists showing the impact on the use of benchmark and formative assessments on student learning?**

- 1.1. **Using Data to Improve Teaching and Learning: Findings from an evaluation of the Formative Assessments of Student Thinking in Reading (FAST-R) Program in Boston Elementary Schools.** *Quint, J., Sepanik, S., & Smith, J.; 2008; MDRC, 126 pages.*

Source: ERIC (#ED503919)

(http://www.eric.ed.gov:80/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/43/05/69.pdf)

From the abstract: "This study examines the effects of the Formative Assessments of Student Thinking in Reading (FAST-R) initiative in the Boston Public Schools system (BPS), where the use of data to improve instruction is a general priority of the school district. The study looks at changes in reading scores over time at 21 BPS schools that operated FAST-R during the 2005-2006 and 2006-2007 school years and changes at a group of comparison schools serving demographically similar students during the same period. Chapter 4 describes the findings from the impact analysis of FAST-R with regard to student achievement, exploring the range of student outcomes on the MCAS and the SAT-9 reading assessments. In addition, the chapter reports on an analysis to measure the impact of FAST-R on students' ability to make inferences and find evidence while reading. Lastly, subgroup analyses to compare the effect of FAST-R on various groups of students (by, for example, gender and socioeconomic status) are discussed. Chapter 5 presents the overall conclusions that may be drawn from the study's analyses and their implications for the use of formative assessments and data-driven instruction to improve reading skills."

1.2. Some Aspects of the Technical Quality of Formative Assessments in Middle School

Mathematics. Phelan, J. K., T., Niemi, D. N., Vendlinski, T., & Choi, K.; 2009; *National Center for Research on Evaluation, Standards, and Student Testing (CRESST), CRESST Report 750*; 61 pages.

Source: National Center for Research on Evaluation, Standards, and Student Testing (<http://www.cse.ucla.edu/products/reports/R750.pdf>)

From the abstract: "While research suggests that formative assessment can be a powerful tool to support teaching and learning, efforts to jump on the formative assessment bandwagon have been more widespread than those to assure the technical quality of the assessments. This report covers initial analyses of data bearing on the quality of formative assessments in middle school mathematics. Specifically, these data address the question of whether relatively short assessments can provide reliable and useful information on middle school students' understanding of conceptual domains in pre-algebra. Items and test forms were developed and tested in four domains (rational number equivalence, properties of arithmetic, principles for solving equations, and applications of these concepts to other domains), all of which are critical to eventual mastery of algebra. We tested the items with sixth-grade students in classrooms in four districts. We then pared down the items to create eight assessment forms that were further tested alongside instructional support materials and professional development. Results of this study suggest that relatively brief formative assessments focused on key conceptual domains can provide reliable and useful information on students' levels of understanding and possible misunderstandings in the domain."

1.3. Measuring How Benchmark Assessments Affect Student Achievement.

Henderson, S., Petrosino, A., Guckenburg, S., & Hamillton, S.; Dec 2007; *Regional Education Laboratory Northeast and Islands at Education Development Center. Issues & Answers No. 39*; 47 pages.

Source: Institute of Education Sciences, U.S. Department of Education (<http://ies.ed.gov/ncee/edlabs/projects/project.asp?ProjectID=43>)

From the abstract: "This report examines a Massachusetts pilot program for quarterly benchmark exams in middle-school mathematics, finding that program schools do not show greater gains in student achievement after a year. But that finding might reflect limited data rather than ineffective benchmark assessments." The second year follow up study is below:

(<http://ies.ed.gov/ncee/edlabs/projects/project.asp?ProjectID=147>)

From the abstract: "This REL Technical Brief examines whether, after two years of implementation, schools in Massachusetts using quarterly benchmark exams aligned with state standards in middle school mathematics showed greater gains in student achievement than those not doing so. A quasi-experimental design, using covariate matching and comparative interrupted time-series techniques, was used to assess school differences in changes in mathematics performance between program and comparison schools. Following up on an earlier Issues & Answers report, with just one year of post-implementation data, the study found no significant differences between schools using this practice and those not doing so after two years."

1.4. Inside the Black Box: Raising Standards Through Classroom Assessment.

Black, P., & William, D.; Oct 1998. *Phi Delta Kappan*, v80 n2; p139-44.

Source: ERIC (EJ575146)

(Abstract Only)

(http://www.eric.ed.gov:80/ERICWebPortal/Home.portal?_nfpb=true&ERICExtSearch_SearchValue_0=Inside+the+Black+Box%3A++Raising+Standards+Through+Classroom+Assessment&searchtype=keyword&ERICExtSearch_SearchType_0=ti&_pageLabel=RecordDetails&objectId=0900019b801254da&accno=EJ575146&_nfls=false)

From Abstract: "Firm evidence shows that formative assessment is an essential ingredient of classroom work and that its development can raise achievement standards. Achieving this goal demands a four-point scheme for teacher development: learning from development, a slow, yet steady dissemination process, reduction of obstacles, and substantive research efforts."

1.5. Promoting Student Achievement Using Research-Based Assessment with Formative Benefits.

2008; *White Paper, Prepared by CTB/McGraw Hill*, 9 pages.

Source: General Internet Search using Google

(<http://www.acuityforschool.com/product-information/AcuityFormativeAssessmentWhitePaper.pdf>)

This article summarizes research that "shows that technology-enhanced formative assessment is a powerful solution that enables educators to more readily monitor progress and improve student achievement."

Additional Organizations to Consult

- **Assessment and Accountability Comprehensive Center (AACC): Data Use Web Sites on Formative Assessment**

AACC Data Use and Formative Assessment Web Site

(http://www.aacompcenter.org/cs/aacc/print/htdocs/aacc/resources_data.htm)

AACC's "Data Use for Continuous Quality Improvement web site on formative assessment

(http://datause.cse.ucla.edu/fa_1.asp)

"The AACC is part of a federal technical assistance system that provides resources for states to help them to fully implement, evaluate, and improve their assessment and accountability systems in order to reach the overarching No Child Left Behind goal of academic proficiency for all students. The AACC Data Use Web Site was developed to help regional centers, states, and other education agencies improve their use of data and increase student achievement. The web site has a space developed to formative assessment with several definitions of formative assessment, an explanation of learning progressions, and a list of further readings."

Key words and search strings used in the search:

Formative Assessment AND Student Learning OR Achievement, Benchmark Assessment AND Student Learning OR Achievement.

Search databases and websites:

Institute for Education Science Sources: Regional Educational Laboratory Program (REL); What Works Clearinghouse (WWC); Doing What Works (DWW); National Center for Education Statistics (NCES); Institute for Education Sciences (IES); IES Practice Guides.

Other Federally Funded Sites: The Assessment and Accountability Comprehensive Center; The National High School Center; The Center on Innovation and Improvement; The Center on Instruction; The National Comprehensive Center for Teacher Quality; National Center for Education Statistics (NCES) Datasets: K – 12; National Assessment of Educational Progress (NAEP); National Assessments of Adult Literacy (NAAL); Early Childhood Longitudinal Study (ECLS); National Household Education Survey (NHES); Career/Technical Education Statistics (CTES); Common Core of Data (CCD); Crime and Safety Data; Education Finance Statistics Center (EFSC/EDFIN); Education Longitudinal Study of 2002 (ELS); National Longitudinal Studies (NLS-72, HS&B, NELS:88); Private School Universe Survey (PSS); School Survey on Crime and Safety (SSOCS); Schools and Staffing Survey (SASS); NAEP Data Explorer (NDE); Data Analysis System (DAS); School District Demographics System (SDDS); Center for Data-Driven Reform in Education (CDDRE); National Center for Research on Early Childhood Education; National Center for Research on Evaluation, Standards, and Student Testing; National Center for Performance Incentives; National Research Center on the Gifted and Talented; National Research Center on Rural Education Support; National Research and Development Center for English Language Learners.

Additional Data Resources: The Campbell Collaboration; Data Quality Campaign; Education Development Center; WestEd; American Institutes for Research; Just for Kids; Great Schools; PSK12; Kids Count; School Data Direct; The Education Trust; SRI International; ERIC; EBSCO Databases; Education Index Retrospective; FirstSearch (OCLC); ProQuest; Educator's Reference Complete; HeinOnline; Education Daily; Government Executive; <http://www.google.com>;

Criteria for inclusion:

When Reference Desk Researchers review resources, they consider, among other things, four factors:

1. **Date of the publication:** The most current information is included unless in the case of nationally known seminal resources
2. **Source and funder of the report/study/brief/article:** Priority is given to IES, nationally funded, and certain other vetted sources known for strict attention to research protocols);
3. **Methodology:** i.e. Random control trial studies, surveys, self-assessments, literature reviews, policy briefs, etc. Priority for inclusion is given generally to random control trial study findings; however, the reader should note at least the following factors when basing decisions on these

resources: Numbers of participants (just a few? Thousands?); Selection (did the participants volunteer in the study, or were they chosen?); Representation (were findings generalized from a homogeneous or a diverse pool of participants? Was the study sample representative of the population as a whole?)

4. **Existing knowledge base:** Although we strive to include vetted resources, there are times when the research base is slim or non-existent. In these cases we have included the best resources we could find, which may include newspaper articles, interviews with content specialists, organization websites, etc.

REL Northeast and Islands

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