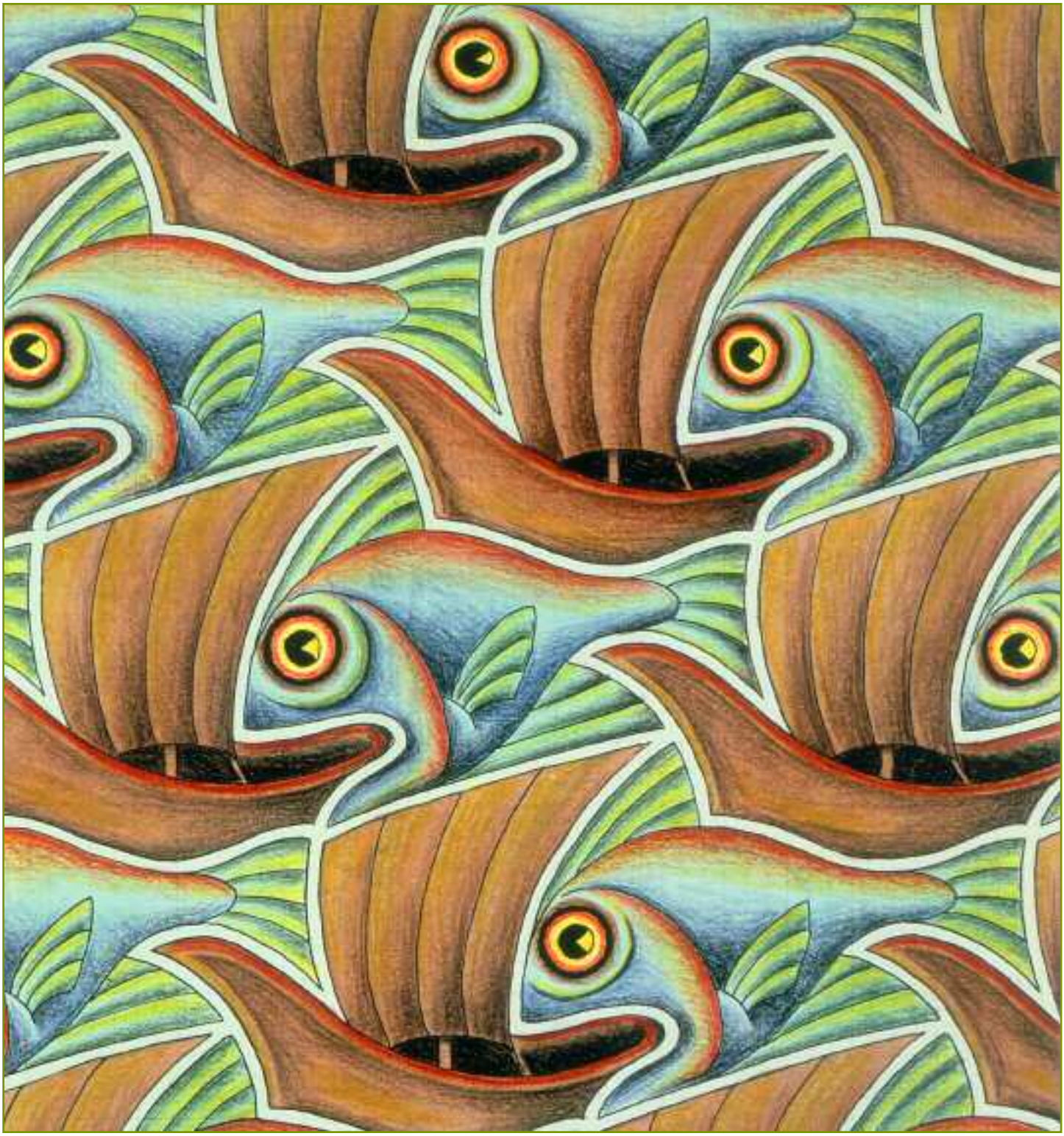
NCSM Journal

of Mathematics Education Leadership

SPRING 2010 VOL. 12, NO. 1



National Council of Supervisors of Mathematics www.mathedleadership.org

Table of Contents

Commentary on Critical Issues in Mathematics Education: What About the Assessment Gap? We Need to Address it—Now!

Francis (Skip) Fennell, *McDaniel College, MD*
Mike Caraco, *Burr and Burton Academy, VT*
Beatriz S. D'Ambrosio, *Miami University of Ohio*
Felicia Phillips, *Atlanta Public Schools, GA*
Karen Mirkovich, *Prince William County Schools, VA*
Tom Reardon, *Fitch High School and Youngstown State University, OH*
Gail Yates, *Christian County Schools, KY*

The following thoughts have been influenced by sessions related to assessment presented at the 11th International Congress on Mathematics Education (ICME) held in Monterrey, Mexico in July, 2008.

The No Child Left Behind (NCLB) Act (2001), now referenced using its original name—the Elementary and Secondary Education Act (ESEA), has forced schools and school districts to not only account for the mathematics performance of all students, including student subgroups, but to also to publically report performance data and identify plans to strengthen that mathematics performance.

But it has also spawned assessment and teaching practices that overemphasize state assessments and created a 'teach to the test' mentality as an effort to ensure that more and more students reach a school's Adequate Yearly Progress (AYP) benchmark.

To reach AYP levels and demonstrate proficiency, many state assessments skim the surface as they attempt to measure state curriculum standards that often contain far too many expectations, address concepts and skills that are less than important, overemphasize skills, and have far less emphasis on complex content, problem solving, and rich mathematical problems that require students to show their work. (There are some notable exceptions to this situation discussed in recent NAEP reports.)

Against this reality backdrop, Secretary of Education Arne Duncan recently (June 14, 2009, at the 2009 Governors Education Symposium) announced that to help measure the soon-to-be-released set of common core curricular standards that states agree upon—no small feat—the U.S. Department of Education will provide $350,000,000 to states and state consortiums to create rigorous assessments linked to the new common core standards. (See the New England Common Assessment Program [NECAP] as an exemplar.) This funding will come from the Race to the Top funds available from the American Recovery and Reinvestment Act (ARRA). Secretary Duncan noted that "once new standards are set and adopted you need to create new tests that measure whether students are meeting these standards." He continued, "We need tests that go beyond multiple choice—and we know that these kinds of tests are expensive to develop. It will cost way too much if each state is doing this on its own. Collaboration makes it possible for this to happen quickly and affordably." A reauthorized ESEA/NCLB based on common curriculum standards would present a leaner, more streamlined set of curricular expectations and perhaps more flexible guidelines for reaching ESEA/NCLB.

As common, more focused, and coherent curriculum guidelines are considered along with more flexible guidelines for defining AYP, it is worthwhile to consider assessment issues generally and internationally. While ESEA/NCLB and the National Assessment of Educational Progress (NAEP) highlight achievement gaps within many states, school districts, and schools, yet another gap exists that is problematic. Yes, we have an assessment gap and it needs to be addressed—now.

Ruiz-Primo, Shavelson, Hamilton, and Klein (2002) identify a continuum of assessment distance as a model for articulating the distance between assessment events and their potential instructional impact. Class-based or *immediate* assessments include informal observations, classroom discussion, and artifacts from a lesson. *Close* assessments are those that teachers embed within their lessons or use to monitor progress. Together, *immediate* and *close* assessments define the typical formative assessments used in this country and internationally. *Proximal* assessments are also teacher or classroom driven, but are the formal unit tests or end-of-chapter exams included in curriculum materials and perhaps mandated by the school district, and are more summative in nature. *Distal* and *remote* assessments include the state ESEA/NCLB-required assessments, standardized achievement tests, ACT and SAT tests, and other such assessments and are also summative. These distal and remote assessments serve a purpose and are important. They provide assessment "snapshots" that indicates how, generally, students are doing but the results have little meaning diagnostically, other than to examine particular types of items along with student errors and successes—classic item analysis issues regarding item difficulty and discrimination.

Continuum of Assessment Distance

- **Immediate:** informal observation or artifacts from a lesson;
- **Close:** embedded assessments and semi-formal quizzes following several activities or lessons;
- **Proximal:** formal classroom exams provided by particular curriculum materials and perhaps required by the district;
- **Distal:** criterion-referenced achievement tests such as those required by ESEA/NCLB; and
- **Remote:** broad outcomes measured over time using norm-referenced tests.

FORMATIVE AND SUMMATIVE ASSESSMENTS: While formative and summative assessments are often used as complementary approaches to assessment, all too often, formative and summative assessments are viewed by teachers and students as distinctly different from each other. The point here is that linking formative and summative assessments together can help close the assessment distance in the continuum discussed earlier. Now, perhaps more than ever, the mathematics education community has the opportunity suggest very strongly that the full continuum of assessments are important opportunities for all students to more fully show what they know, and that any reauthorization of No Child Left Behind must consider varied assessments from immediate to remote or formative and summative.

EQUITY AND ASSESSMENT: Many countries successfully meet the needs of their multilingual students in classrooms where the language of instruction may differ from the languages used by students at home. Policies regarding the language of instruction vary tremendously throughout the world and even within countries. The decision in some areas of the United States to prohibit teachers and children from using languages other than English during instruction and on assessments may need serious reexamination, given the experiences of so many countries that embrace the multilingual nature of the members of their classroom communities. These policies have a significant impact on issue of access to educational opportunities, both as a result of opportunities to learn and as a result of their performance on standardized assessments, and need to be addressed.

CLOSING THE ASSESSMENT GAP: There is a gap, an assessment gap, and it certainly needs to be closed—now. We are over-assessing far too many of our students and the assessments are many, varied, and, far too often, not connected to teaching and learning. It is time, right now, to blur the assessment continuum. Teachers need to use assessment to help inform their teaching, to assist them in determining student needs and interventions, and to compare student progress across instructional units and grade levels. From immediate to distal, from formative to summative, the assessments need to be part of a plan—a well-articulated plan that focuses on using assessment to truly assist in the teaching and learning process. To do this right, the mathematics education community in the United States must focus more carefully on issues of equity as it relates to assessment. If we seek evidence of mathematical understandings with varied forms of assessment,

we could paint a different picture of the mathematics achievement of many of our students. The conversation about achievement has to become much more robust, and to do this, our assessment gap must close. It must blend formative and summative assessments if we are to honor and celebrate the knowledge of our students and the knowledge base of the communities to which they belong. This is especially important as we consider the potential of common curriculum standards and assessments.

In closing, we submit the following questions, just as an initial step in considering your own assessment plan, and linking assessment to important issues of teaching and learning:

- What is your state or school district's assessment plan?
- How do you use formative and summative assessments to determine student needs and interventions?
- How does your assessment plan accommodate the needs of mathematics learners whose primary language is not English?
- Is the use of formative assessment a regular component of every teacher's mathematics lessons? How do you know?
- Do students have opportunities to demonstrate what they know via assessments that are not test-like?
- How do you implement and use the data gathered from a full range of assessment opportunities—from immediate to remote and both formative and summative?
- How will your formative and summative assessments change as common curriculum standards become a reality?

References

Cobb, P. (2008). *District Development as a means of improving Mathematics Teaching and Learning at Scale.* Vanderbilt University, ICME – 11, Monterrey, Mexico.

Deitcher, R. (2008). *The Development of children's self-assessment in mathematics within the framework of a problem-solving lesson: a participatory action research project.* David Yellin Academic College of Education, Israel, ICME – 11, Monterrey, Mexico.

Duncan, Arne (2009) 2009 Governors Education Symposium, Cary, NC.

Mogensen, A. (2008) *Portfolio as a learning strategy and a tool for assessment- a Danish experience.* VIA University College, Denmark, ICME – 11, Monterrey, Mexico.

National Mathematics Advisory Panel. *Foundations for Success: The Final Report of the National Mathematics Advisory Panel* (2008). United States Department of Education: Washington, D.C.:

Nystrom, P. (2008). *Every assessment must be formative for something or someone.* Umea University, Sweden, ICME – 11, Monterrey, Mexico.

Pinto, J. & Santos, L. (2008). *The teacher's oral feedback and learning.* Polytechnic Institute of Setubal, & University of Lisbon, Portugal, ICME – 11, Monterrey, Mexico.

Pinto, F.L. & Santos, L. (2008). *Definition of assessment criteria/self-assessment.* University of Lisbon, Portugal, ICME – 11, Monterrey, Mexico.

Ruiz-Primo, Maria, R. J. Shavelson, L. Hamilton, S. Klein (2002). On the Evaluation of Systemic Science Education Reform: Searching for Instructional Sensitivity. *Journal of Research in Science Teaching*, vol. 39, no. 5.