

Preparing for the 2009–2010 Math Textbook Adoption

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The goal was to clearly communicate and document the importance of mathematical materials that support development of the National Council of Teachers of Mathematics (NCTM) process standards. Teachers teach to the materials. If the mathematics materials support mathematical process, then the likelihood of teaching process increases dramatically.

The initial part of this presentation focused upon mathematics epistemology and compared traditional mathematics to reform mathematics. Traditional math focuses upon procedural proficiency whereas reform math also focuses on problem solving and conceptual and process understandings as well. This was illustrated using two tasks. In a traditional math classroom, students might be asked to compute $(-3) \times (-4)$. In a reform classroom, students might see a task such as: “Find and describe a real world example that models arithmetic operations of integers. Using the real world model, write an essay explaining why $(-3) \times (-4) = +12$.”

The second part defined Standards-based materials for teaching reform math. Important features of such materials include teaching comprehensively, learning to communicate coherently, developing ideas in depth, promoting sense making, engaging students, and motivating learning.

The third part of the session looked at large scale research on the efficacy of Standards-based materials. The results of several studies were presented, showing that students in schools using Standards-based curricula preformed significantly better on standardized tests.

The fourth part discussed the national and state standards and the focus upon process standards as well as content standards. (Process standards are problem solving, communication, connection, reasoning and proof, and representation.)

The fifth part of the presentation investigated how ISTEP+ math assessment tests student processes. Examples of different tasks on problem solving, reasoning and proof, communication, connections, and representation were given.

Finally, we looked at Elkhart Community Schools ISTEP+ data, which compared the outcomes of Elkhart with the state at the elementary (reform) and the secondary

(traditional) levels. Twenty-one percent of Elkhart Community Schools students are Hispanic, 19% are African American, 25% have limited English proficiency, and 59% receive free or reduced-price lunches; these groups represent a large and growing demographic of the IMI districts. Use of the reform program at the elementary level appeared to close the achievement gap between the scores of Elkhart students and average scores of students in all of Indiana, in all of the demographic groups, but most strikingly among minority students. However, use of the traditional program at the secondary level appeared to maintain or widen the gap for all groups. This part of the session included a lively discussion focused upon the district data of Elkhart Community Schools.