Data Analysis and Probability Materials for Use in the 7th and 8th Grade Classroom

Summary:

The purpose of this project was to create a unit of materials for Data Analysis and Probability that could be used by a 7th or 8th grade teacher to teach the Ohio Academic Content Standards in this area. The materials were created using a hands-on activity approach that incorporated technology when appropriate. Each lesson began by listing the Ohio Academic Content Standard, Benchmarks, and Indicators for both grade levels. Next, a rationale was presented to explain why the concept(s) being taught was important. A list of materials/resources for the lesson followed next. After that came a detailed list of procedures that could easily be followed by even a beginning teacher. Finally, details on assessment were included. A set of student worksheets were also included with each lesson.

There were many reasons why I chose to do this particular project. The first reason was because I had been to several professional development classes (e.g., Ohio Mathematics Academy Programs, inclusion seminar, behavior management class, TI-83 training) and each one had advocated for a more hands-on, student-centered approach to learning. Every time I went to one of these classes, I would leave with materials and a great deal of enthusiasm. Unfortunately,
the materials lasted, but the enthusiasm waned. I realized that if I was to ever change my teaching in a major way, I couldn’t wait any longer.

The second reason I chose this project was because in my own classroom I had observed students motivated to learn when given a task, especially if that task involved technology. Susan Gross, an educator from Maryland, shared my observations. She collected classroom observations from middle school mathematics classes in Rockville, Maryland to help her answer questions about student performance. Gross observed students in many mathematics classrooms being taught the content in isolation. Little attempt was made to make instruction investigative or dynamic, or to relate mathematics to other disciplines or real-world problems. In many classrooms, students appeared to be intellectually engaged with the concepts that were presented; however the lack of connection of mathematics with real-world problems appeared to confuse some students and lead to off-task behavior in other cases. In classrooms where real-world connections were made and mathematics was presented as investigative in nature, observers reported students as being on task, participating well throughout the lesson, asking questions, carrying on discussions, and making connections (Gross, 2000).

The fourth reason was due to the numerous articles I’ve read on instruction that pointed to an increase in student problem-solving skills due to active learning rather than passive learning. This increase in problem-solving skills prepared students for high school and beyond by helping them make connections between mathematics and the real world. Data from the National Assessment of Educational Progress (NAEP) revealed that eighth grade students across America were unprepared for the rigors of high school work. Nationally, 39 percent of eighth graders who
Ackley took the NAEP mathematics examination in 1996 scored below the “basic” level—indicating they lacked the fundamental skills most Americans would agree are necessary to be successful in high school (SREB, 1998). The “basic” level referred to students being able to work with the four arithmetic operations in simple one- or two-step problems and to apply some mathematical definitions on an elementary level. Students who performed at this level were likely to possess a satisfactory level of competency with computation; however, they routinely lacked a conceptual understanding of many fundamental mathematical concepts. Furthermore, students at this level were usually not able to regularly apply simple reasoning and problem-solving strategies (SREB, 2002). It is my belief that by focusing curriculum on a learner-centered design rather than a subject-centered design in mathematics (Ornstein & Hunkins, 2004) we will be able to bridge the gap between computational literacy and conceptual understanding.

The final reason (this goes back to reason #4) was the way our school district centered the Pre-Algebra curriculum around the textbook it uses. When the district first adopted the textbook (*Pre-Algebra*, Prentice Hall), they formed a Textbook Realignment Committee. This committee’s job was to align the Ohio Academic Content Standards to the textbook. They worked hard and produced a map of the skills that corresponded to lessons in the textbook. This map was made available to teachers in both written and CD form. The ODE (Ohio Department of Education) Website was suggested for alternative lessons, but this site is continually being updated and doesn’t have a lesson for every skill as of now. By creating a unit of lessons for Data Analysis and Probability, I can have a ready-made source of alternative lessons for this Standard that can be shared with peers.
Bibliography:


ODE is an informational Website for Ohio educators (http://www.ode.state.oh.us).


Southern Regional Education Board, Atlanta, GA. (2002). *Getting students ready for algebra I: What middle grades students need to know and be able to do*. (Available from the Southern Regional Education Board, 592 10th St. N.W., Atlanta, GA 30318)