Mary Jane Dickey

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MATH 303

Textbook Analysis

Mathematics through the Ages

The math focal point I chose to research is Geometry, particularly angles, line segments and rays. Math education has changed dramatically over the past sixty years. I looked through three mathematics textbooks that were published during three different eras of the math education movement. The first text book that I looked at is called *Teaching Elementary School* Mathematics for Understanding, was published in 1958. Before I even began reading the book, I tried to think about how math was taught during the late 1950s just by looking at the title of this text book and skimming through the pages. This era textbook suggests that mathematics instruction focused on understanding concepts, however when I looked through the text there were many paragraphs of words and small pictures, but nothing that suggested activities that enhanced understanding of concepts. The chapter that focuses on Geometry has paragraph upon paragraph that define the specific words like line segment, line, ray, etc. The definition vocabulary is not very student friendly as many of the explanations are extremely wordy and the words are quite complicated and hardly explain what a line segment actually is. There are very few example problems for students to look at and try for themselves. The examples in the book are in the margins, and are quite small and at times they are more confusing than the explanations in the paragraphs. This textbook does not seem to match any of the current NCTM standards. While the book does suggest that it focuses on helping students understand, which

would be a part of the learning principle, I do not see much curriculum principle, and "big idea" connections that would enhance and enable the understanding.

In the late 1950s, both of my parents where in elementary school, and looking at this teacher textbook, find it interesting that my parents were taught from a book similar to this one. I am not sure if I were a teacher in the late 1950s, if I would have enjoyed teaching math very much due to the confusing nature of the diagrams and definitions in this text. How could I have helped my parents understand mathematics when many of the subheadings in this section about Geometry do not actually focus on teaching? Half of the examples in the section about "rays" are taken from a scenario about a teacher and the students in his class. However, there are so good suggestions to extend the discussion about rays at the end of the section that are called "Other Experiments and Experiences for Pupils." One great activity is having students find examples of line segments and angles outside of the classroom and then coming together and posting them on the board. This is the sort of thing I would have my students understand geometry, I would not feel comfortable in my own understanding of the text, let alone trying to assist my students in their understanding of the concepts.

The second text book is called *Mathematics Plus*, and it was published in 1992. The title of this book makes me think that not only will students be learning math; they will also be learning something more, perhaps students will be making connections to the content and drawing their understanding from real life examples. Looking through the chapter on geometry one of the first things I come to is a "Connections to prior learning" section where teachers draw in connections to concepts from what students already know. The next page talks about using manipulatives as enhancers of learning and understanding, and a lot of linking to concrete,

pictorial, and abstract concepts about geometry to meet the different learning needs of students. There are activities laid out for students to use toothpicks to illustrate line relationships and different planes. Down on the bottom of the page in this teacher book, there are boxes that have supplemental activities for "meeting individual needs." The language used to define terms is very reader friendly, so the teacher is able to understand what he/she is going to teach, and he/she can put concepts and definitions into words that students can understand. There are helpful introductory activities along the side and resources for reteaching, practicing, and enriching the content. This textbook is somewhat aligned with the NCTM standards in that it focuses on the curriculum principle, and the big ideas of math; making connections. There is also evidence of the teaching principle in which student practice their developing math skills with daily activities, which are suggested in the margins.

I began elementary school in the early-mid 1990s, so this textbook, or one similar to it was probably used during my math education experiences. This text book is very educator friendly, and provides different activities for teachers to do with students. Compared to the text from the 1950s, this math book is very hands on and full of connections to real life experiences. The 1990s must have been a time where learning was student-centered, and everything was hands on, while the 1950s was very teacher-centered, and most students probably sat at their desks all day. If I were to teach using this book from the early 1990s I would feel much more comfortable with the subject and the students would have more opportunities to do hands on activities with mathematics concepts like geometry.

The third mathematics textbook that I looked is called *Saxon Math 5/6*, which was published in 2004. The title of this book does not tell me anything about what teaching mathematics is like in the twenty first century. What I gather from the title is that this textbook is

named after an individual. As I look through the pages that deal with geometry this textbook is very similar to the book printed in the 1990s. It is more instructor and student friendly in terms of language used, and there are instructional notes off to the side, in the margin, that help lead the teacher on the right path. There are areas where it suggests use of manipulatives and drawing connections to life and real world examples. This teacher's manual even points out problems where students may make errors and provides helpful reminders for teachers to explain to students to prevent error. This textbook appears to be more aligned with the NCTM principles and standards than any of the other textbooks. The curriculum principle, which I find to be one of the most important, is evident with the connections blurbs and exercises that enable students to connect to the concepts of math with real world situation. Students use technology and manipulatives that increase exploration and enhance the learning they are experiencing.

Current elementary school students are learning from the Saxon math textbook, and other textbooks that are similar. It seems to be fairly similar to the textbook of the 1990s; however it is more standards based, and helps teachers with standard accountability. As a student teacher, I will be using this textbook to teach my fifth graders. I feel that this textbook provides me with enough information, and reader friendly language that I can help my students succeed in mathematics. The different shifts in mathematics education will continue along with other movements in the field of education, in general. It is important that educators stay informed about new topics, and revised, or revisited educational movements.

Bibliography

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