

Chapter 30

The Impact of *Investigations and the Interactive Whiteboard* on Students' Mathematical Practice in *Investigations* Classrooms

Linda Boland
Pearson Education Inc., USA

ABSTRACT

This chapter relates the classroom experiences of 44 teachers across the United States, implementing Investigations in Number, Data, and Space, an elementary school mathematics curriculum. These teachers participated in a “tryout” of Investigations for the Interactive Whiteboard with their students. Investigations for the Interactive Whiteboard was developed in collaboration by Pearson, TERC, and SMART Board. The teachers’ reactions showcase how the use of this technology enhanced the teaching and learning of mathematics. These vignettes illuminate the essence of Common Core Standards for Mathematical Practice (CCSSI, 2010), which describe how students should engage with the mathematical skills and concepts of the Common Core Content. The use of the interactive whiteboard engaged all students, motivated them to participate beyond their norm, allowed modeling of the mathematics which opened access to all students, and encouraged students to explain, argue, and defend their ideas while listening to and critiquing others, the essences of the Standards for Mathematical Practice.

DOI: 10.4018/978-1-4666-4502-8.ch030

INTRODUCTION

This chapter shares the “story” of teachers using interactive whiteboard software in their classrooms to support, enhance and extend their teaching of mathematics using *Investigations in Number, Data, and Space*, 2nd edition, and the students’ engagement, interactions and strategic thinking in learning mathematics. This chapter will also showcase the history and development of the *Investigations* program and the *Investigations and the Interactive Whiteboard* technology, relate the teachers’ experiences using the software in their classrooms through anecdotes, and highlight the impact it makes on students’ motivation, participation and achievement of Common Core Mathematical Practice.

INVESTIGATIONS IN NUMBER, DATA, AND SPACE CURRICULUM

In 1989, the National Council of Teachers of Mathematics (NCTM) produced the *Curriculum and Evaluation Standards for School Mathematics*. At the time, this document was controversial because they called for drastic change in mathematics teaching. And in education, making a change is often controversial! These Standards called for more emphasis on conceptual understanding and problem solving informed by a constructivist understanding of how children learn. The National Science Foundation (NSF) issued a call for the development of curricula based on the NCTM *Curriculum and Evaluation Standards for School Mathematics*. In 1990, TERC, a non-profit research and development organization whose mission is to improve mathematics, science, and technology teaching and learning, was awarded a grant to develop a K-5 elementary mathematics curriculum.

Led by Susan Jo Russell, the project’s Principal Investigator, the first edition of *Investigations in Number, Date, and Space* was created and implemented in classrooms. The intention in

developing the curriculum was to ensure that all students are included in significant mathematics learning through these aspects (Economopoulos, Mokros, & Russell, 1998):

- Students spend time exploring problems in depth.
- Students find more than one solution to many problems they work on.
- Students develop their own strategies and approaches, rather than relying on memorized procedures.
- Students choose from a variety of materials and appropriate technology as a natural part of their everyday mathematical work.
- Students work in a variety of groupings - whole class, individually, in pairs, and in small groups.
- Students move around the classroom as they explore the mathematics in their environment and talk with their peers.

These goals from 1998 align closely to the CC-SSM Standards for Mathematical Practice. In fact the authors of the CCSSM (CCSSI, 2010) wrote:

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/the-impact-of-investigations-and-the-interactive-whiteboard-on-students-mathematical-practice-in-investigations-classrooms/88169

Related Content

Moving Into New Literacies?: Young People's Reading Conceptualizations and Practices

Neuza Pedro and Clara Jil (2022). *Modern Reading Practices and Collaboration Between Schools, Family, and Community* (pp. 81-104).

www.irma-international.org/chapter/moving-into-new-literacies/302775

The Use of Eye-Tracking in Spatial Thinking Research

Alina Nazareth, Rosalie Odean and Shannon M. Pruden (2019). *Early Childhood Development: Concepts, Methodologies, Tools, and Applications* (pp. 588-609).

www.irma-international.org/chapter/the-use-of-eye-tracking-in-spatial-thinking-research/219599

edTPA Preparation: Building Support Structures for Teacher Candidates

Randa Suleiman and Clavon Byrd (2016). *Special and Gifted Education: Concepts, Methodologies, Tools, and Applications* (pp. 1938-1965).

www.irma-international.org/chapter/edtpa-preparation/151285

Teach Less and Learn More: Enhance the Student Learning Experience Through an Innovative Curriculum

Ratneswary Rasiah, Sotheeswari Somasundram, Kelly Pei Leng Tee and Jason James Turner (2021). *International Journal of Curriculum Development and Learning Measurement* (pp. 29-42).

www.irma-international.org/article/teach-less-and-learn-more/269746

All the Class Is a Stage

Abhilash Ashok and Asha Priya (2020). *International Journal of Curriculum Development and Learning Measurement* (pp. 11-18).

www.irma-international.org/article/all-the-class-is-a-stage/247107