

Chapter 63

Using Technology to Teach Gifted Students in a Heterogeneous Classroom

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ABSTRACT

The answer to educating gifted and talented students in heterogeneous classrooms may lie, at least partially, in using instructional technology to motivate learning and enrich lessons. This case study explores one aspect of effective instruction for gifted second graders during lessons conducted in their general education classrooms. This chapter summarizes the development and delivery, students' performance and perceptions, and professional implications of an elementary science lesson utilizing interactive whiteboard technology to convey science content and elicit participation. It also emphasizes the importance of teacher educators' modeling the use of interactive whiteboards for the purpose of differentiating instruction in teacher training programs to better prepare future teachers for the diverse learners who will fill their classrooms.

ORGANIZATION BACKGROUND

Substantial reports over the past 15 years indicate that large numbers of teachers choose to leave the profession early in their careers (Darling-Hammond & Sykes, 2003; Hare & Heap, 2001; Johnson, 2001; Pipho, 1998). According to 2004-2005 data collected by the National Center for Education Statistics, nearly a quarter of public-school teachers leave the profession within the first three years (Boyd, Grossman, Lankford, Loeb, Wyckoff, & National Bureau of Economic Research, 2008; Marvel, 2007), and nearly half of all teachers leave the profession after five years of teaching (Ingersoll, 2007; Alliance for Excellent Education, 2005; National Commission on Teaching and America's Future, 2003). The percentages of attrition are greatest for teachers in math, science, and elementary special education (Ingersoll,

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2007). Though there may be many reasons for teacher attrition, the short-comings of a traditional teacher preparation program have been cited as at least partly contributing to the continuous teacher turnover currently plaguing the profession (Haberman, 2005; Kent, Feldman, & Hayes, 2009).

Preservice teachers must experience a wide range of learning opportunities during their preparation program to avoid feeling underprepared when they begin teaching (Kuster, Bain, Milbrandt & Newton, 2010). Advocating a one-size-fits-all approach to teaching does not work (Stotsky, 2006) because a classroom full of “regular” students simply does not exist. The disparity between the abilities of students in a single classroom is greater than ever before, thus, today’s elementary teachers must be able to deliver lessons that accommodate students’ varied learning styles and wide range of abilities when they are heterogeneously grouped for instruction. The future success of educating students who have an array of learning skills, academic abilities, physical challenges, and cultural variations is contingent upon how well prepared educators are in the pedagogies of differentiating instruction (Kent & Giles, in press).

Preservice teachers must be well prepared to teach in an innovative manner, utilizing principles and practices for differentiating instruction advocated in quality teacher-preparation programs. Further, novice teachers must be prepared to sustain this kind of teaching when faced with the obstacles of an overwhelmingly diverse student population (Lloyd, & Sullivan, 2012). The situation becomes even more challenging when considered in light of ever changing federal, state, and local regulations and expectations for student performance, particularly in regard to the recent adoption of Common Core State Standards and an increased investment in science, technology, engineering, and mathematics (STEM) education. Unfortunately, the needs of high-achieving and academically advanced students may become overlooked by elementary educators in the mist of such demanding circumstances.

Differentiating instruction is too often associated with making accommodations and/or adjustments for individuals with disabilities, who have a federally mandated Individual Education Program (IEP) to ensure that their instructional needs are appropriately met. While students identified as gifted and talented often receive supplemental services through enrollment in a gifted program when funds and space are available, their curriculum and instruction in regular classrooms is often provided without differentiation from that of the general population. The answer to educating gifted and talented students in heterogeneous classrooms may lie, at least partially, in using instructional technology to motivate learning and enrich lessons.

It is imperative that preservice teachers have experiences with gifted and talented students to extend their ability to address the learning needs of these students. First, instruction on the characteristics of gifted and talented students is needed. Preservice teachers must have the knowledge necessary to identify these students, especially in the lower grades where formal identification and classification may not yet be an option in some school systems. Further, preservice teachers must be provided with experiences in designing, implementing, and assessing lessons that address the needs of gifted students using instructional technology. Incorporating technology into instruction to introduce, expand, bring closure, extend, and assess the success of the lesson is a huge challenge for many new teachers. Despite initial frustration and, at times the feelings of being overwhelmed, instructional technology enables both pre- and in-service teachers to address the educational needs of the gifted and talented students.

This case explores one aspect of effective instruction for elementary students of varying academic abilities during science lessons conducted in their general education classrooms. The development and delivery, students’ performance and perceptions, and professional implications of student engagement in a second grade science lesson employing interactive whiteboard technology are summarized. The focus of this chapter includes both the delivery and student perceptions of SMARTBoard® use as well as the

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