

Math Motivation with SMART Board Technology

Report on the use of the SMART Board Interactive Whiteboard to enhance math motivation in students with disabilities

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Purpose

My project's objective is to increase students' motivation in math through the use of technology, specifically through the use of the SMART Board. Students with learning disabilities, often due to past frustration, sometimes have a lack of motivation toward learning. They also may learn in different ways from their non-disabled peers. Technology such as the SMART Board helps students with different learning styles learn more effectively (Bell, 2002). This in turn increases motivation. Visual learners can see their work projected and gain immediate feedback on their work. Auditory learners can use different software to interact with the board. Tactile learners can use different colored pens to write on the board and highlight important ideas. The SMART Board is an exciting and important tool in increasing motivation in the classroom.

Background

Pedagogically, my study is significant in that it will demonstrate how technology can motivate students with learning disabilities to reach their full potential. In order to improve motivation to learn, it is important to present lessons and assign learning activities that are fun and interesting. This in turn will increase motivation in students. (Bos, Schumm & Vaughn, 2003). The SMART Board helps to present lessons in a fun, interesting and creative way. BECTA (British Educational Communications and Technology Agency, 2003) describes how increased motivation is a key benefit from Interactive Whiteboards. Also, the

ability to present and talk about students' work helps to raise self-esteem and keep students on task. As Jones (2004) states in his research, current studies demonstrate that Interactive Whiteboards engage pupils more than traditional teaching and increase motivation and enjoyment. William D. Beeland, Jr., (Beeland, 2002) completed a research study on student engagement and Interactive Whiteboards. His research clearly indicated that Interactive Whiteboards increase student engagement during the learning process.

Dev, P.C.,(2006) conducted a study on intrinsic motivation relating to students with learning disabilities. He noted three psychological needs that motivate an individual intrinsically. They are a desire to feel self-determining, competent and connected to others. The Interactive Whiteboard allows students with learning disabilities to meet all three needs.

Research Design

The students in this study consisted of seven students in the fifth grade. These students are in a self-contained cross-categorical special education class. Disabilities in this class include autism, bi-polar disorder, behavioral disorder, attention deficit disorder, cognitive delay, learning disability, and cerebral palsy. These students all struggle with learning basic math facts and math concepts as well as a lack of motivation toward learning math.

My research strategy is to collect data over 3 periods: pre-SMART Board period, introductory SMART Board period and a concluding SMART Board period. This strategy will allow me to test my hypothesis that use of the SMART

Board increases motivation in math for students with special needs. The time frame is as follows:

Pre-SMART Board period:	August 21, 2007 to October 24, 2007	45 days
Introductory SMART Board period:	October 25, 2007 to January 14, 2008	45 days
Concluding SMART Board period:	January 15, 2008 to March 31, 2008	45 days

I will show that the SMART Board increases motivation by giving a 10 question survey of how the students feel about learning math facts and concepts. The first survey will be given pre-SMART Board; the second survey will be given during the training period; and the last survey will be given when the students are familiar and comfortable using the SMART Board on a daily basis. One study that supports this finding is by Miller, Glover & Averis (2005). Using the Interactive White Board to teach math encouraged intrinsic stimulation, sustained focus and stepped learning. For example, using 'virtual manipulatives,' such as a fraction wall, will allow students to better visualize and master the target concept.

Penny Latham (2004) describes in her study how children were asked to find the area of shapes. The students, with the help of the Interactive White Board, were able to imagine, describe, and model solutions to the problem. The research in support of using the Interactive White Board to effectively teach math and motivate students is very persuasive. My students who have learning disabilities would be able to access their specific learning needs and styles thanks to the SMART Board.

Sample Student Survey

Name _____ Date _____ Math

Survey

Rate the following statements using the given scale.

1= agree

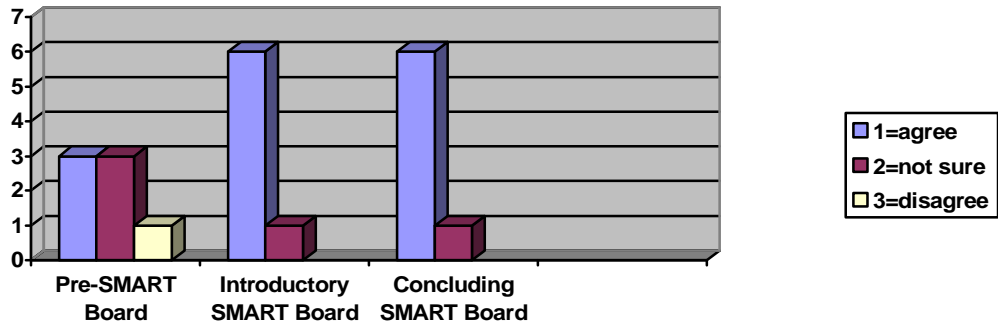
2= not sure

3 = disagree

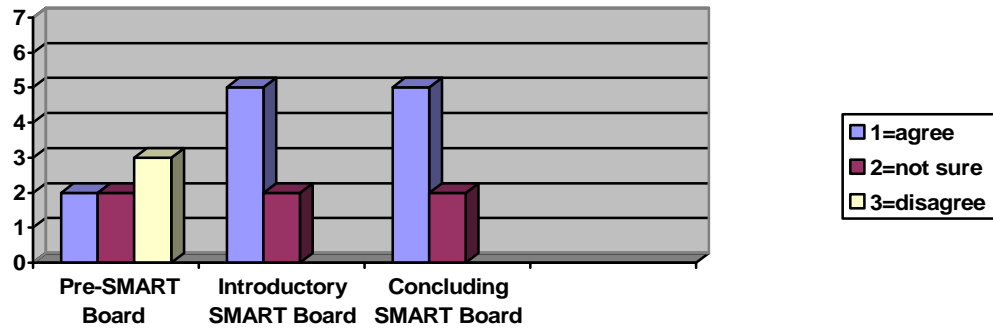
Statement	Rating
1. Math class is interesting.	
2. I understand what I am learning in math class.	
3. Math class is hard for me.	
4. I try my best in math class.	
5. I can't understand what I am learning in math class.	
6. I can understand what the teacher is teaching me on the board.	
7. I like to tell my family what I am learning in math class.	
8. Math class is boring.	
9. I like math class.	
10. I look forward to math class.	

The results from the survey are as follows:

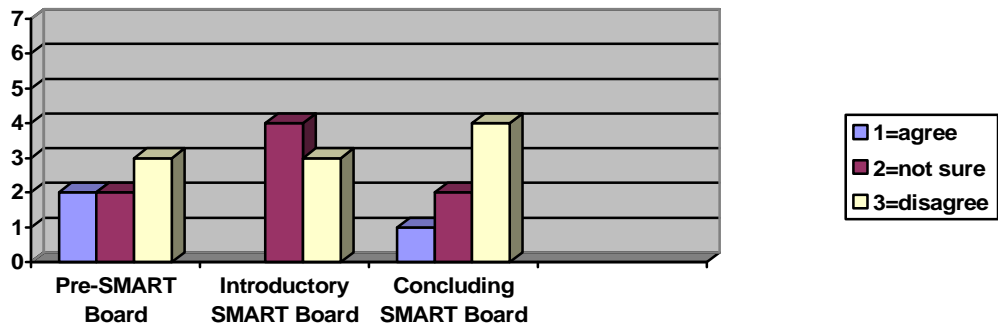
Question #1 Math class is interesting.



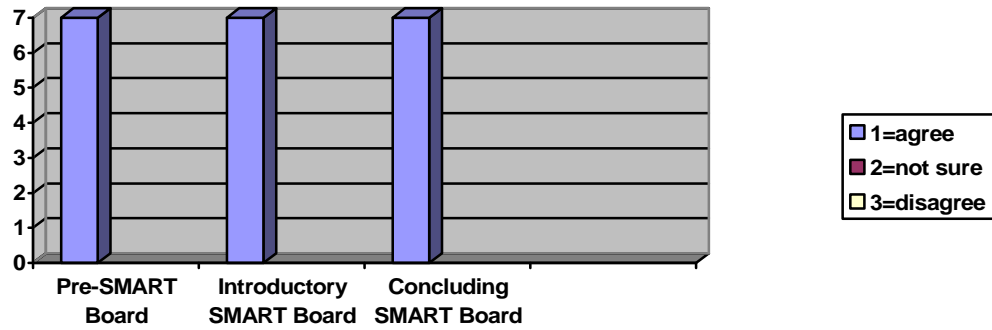
Question #2 I understand what I am learning in math class.



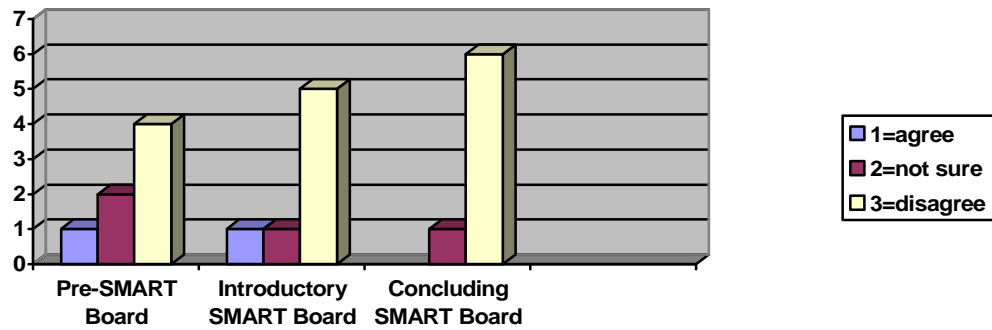
Question #3 Math class is hard for me.



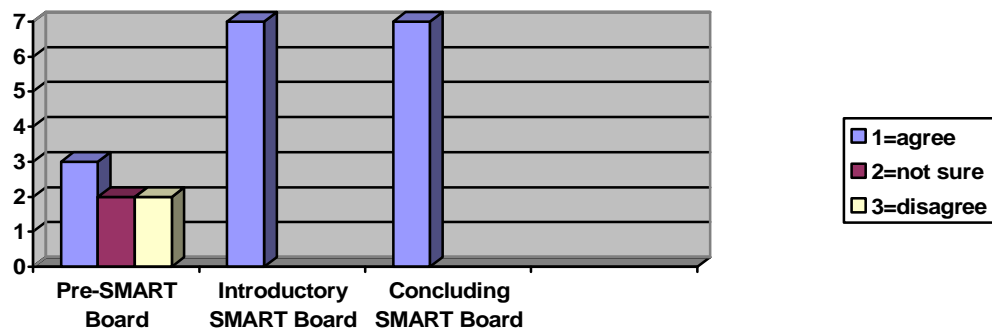
Question #4 I try my best in math class.



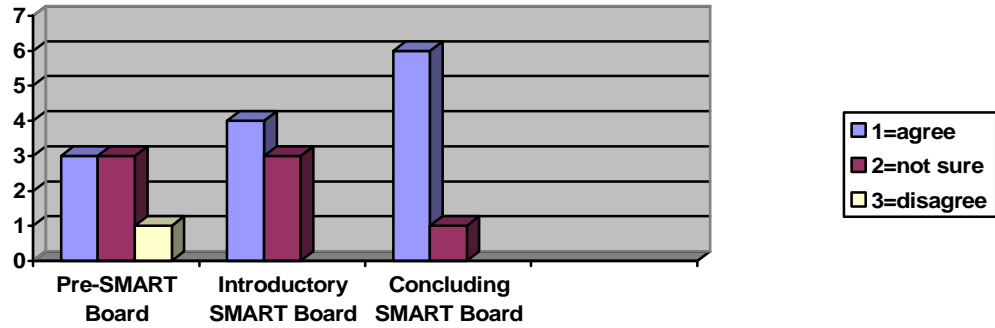
Question #5 I can't understand what I am learning in math class.



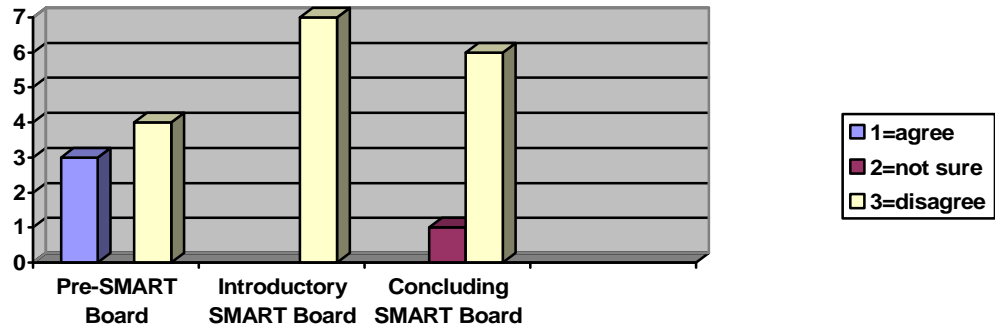
Question #6 I can understand what the teacher is teaching me on the board.



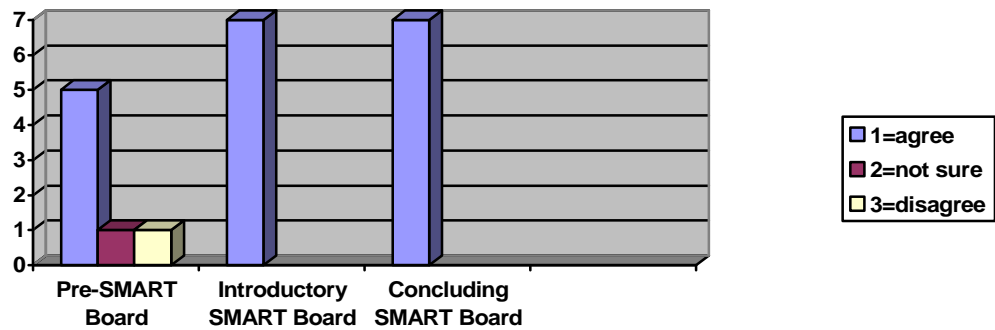
Question #7 I like to tell my family what I am learning in math class.



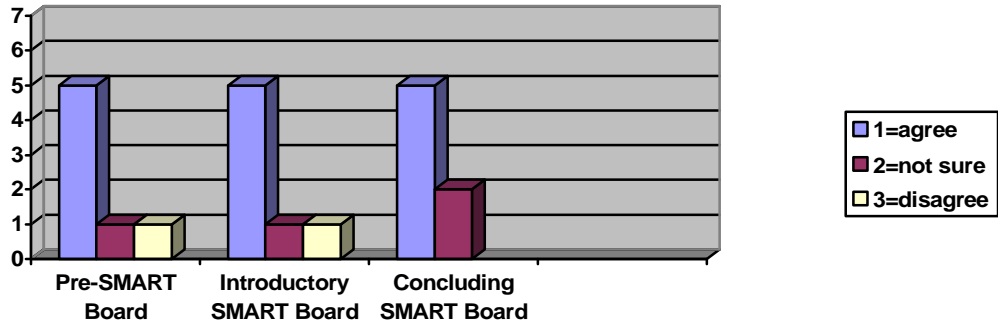
Question #8 Math class is boring.



Question #9 I like math class.



Question #10 I look forward to math class.



Results and Evaluation

The hypotheses stated that the use of the SMART Board would increase motivation in math for students with special needs. Evidence to support this hypothesis was found in evaluating the survey results from the Pre-SMART Board period, Introductory SMART Board period, and the Concluding SMART Board Period. Students noted that math class was more interesting and more understandable with the use of the SMART Board. They also were more likely to share what they are learning with their families. Students who had previously not liked math class, noted that they now liked math class. Students also looked forward to math class after the introduction of the SMART Board. Some observations noted by the teacher were that students were more engaged during the learning process. Concepts that were difficult to understand became clearer with the help of 3-D imagery and virtual math manipulatives. In conclusion, the SMART Board is a valuable tool to help students with special needs reach their full potential in math. The hypothesis was correct in that motivation was increased in math after the introduction of the SMART Board. After teaching with the SMART Board, I have observed how much my students have learned this year. I am thankful for the SMARTer Kids Foundation for giving me this opportunity to have the SMART Board become a part of my classroom.

References

- BECTA Research Reviews (2003) What the Research Says about Interactive Whiteboards. Paper No. 7 Retrieved June 8, 2007 from the World Wide Web:
http://www.becta.org.uk/page_documents/research/wtrs_whiteboards.pdf
- Bell, M..2002. Why use an Interactive Whiteboard? A baker's dozen reasons! Teachers. Net Gazette, 3(1) January 2002. Retrieved August 13, 2006 from the World Wide Web:
<http://teachers.net/gazette/Jan02/mabell.html>
- Bos, C.S., Schumm,J.S., & Vaughn, S. (2003) *Teaching Exceptional, Diverse, and At-Risk Students in the General Education Classroom*. Boston: Allyn and Bacon.
- Brown, A., Miller, D., & Robinson, I. (2002, Nov/Dec.). Widgets on the Web. *Teaching Exceptional Children*, 35(2).
- Dev,P.C., (1996). Intrinsic Motivation and the Students with Learning disabilities. (ED 403723). Retrieved on April 23, 2007 from the World Wide Web:
<http://digitalcommons.libraries.columbia.edu/dissertations/AAI3005801/>
- Edwards, J., Hartnell, M., & Martin, R. (2002) Interactive Whiteboards, Some Lessons for the Classroom. *Micromath*, 18 (2) 30-34.
- Jones, K. (2004), Using Interactive Whiteboards in the Teaching and Learning of Mathematics: a Research Bibliography, *Micromath*, 20 (2), 5-6.
- Latham, Penny. Teaching and Learning Primary Mathematics: The Impact of Interactive Whiteboards. (2002) Retrieved June 9, 2007 from the World Wide Web:
<http://www.bsrlm.org.uk/IPs/ip25-1/BSRLM-IP-25-1-14.pdf>
- Miller, D., Glover, D., & Averis, D. (2005), Presentation and Pedagogy: the Effective Use of Interactive Whiteboards in Mathematics Lessons, in D. Hewiitt and A. Noyes (Eds), *Proceedings of the Sixth British Congress of Mathematics Education* held at the University of Warwick, pp. 105-112. Retrieved from the World Wide Web on May 23, 2007: <http://www.bsrlm.org.uk/IPs/ip25-1/BSRLM-IP-25-1-14.pdf>