



Final Report

The Near North District School Board engaged in a three month research project involving the integration of technology into teacher instructional practice, with a specific focus on math. Two schools were selected to take part in this research project; Silver Birches School in North Bay and William Beatty School in Parry Sound. Silver Birches had one intermediate division classroom teacher participate in the research project. William Beatty School had two intermediate division teachers participate in the research project.

A research project, complete with an essential question was submitted to the North Eastern Ontario Education Network (NEOEN) for funding. Once this action research project was approved, the appropriate funds were distributed to our school board, and allocated according to our project proposal. This included the purchase of one SMART board, data projector, and a laptop computer for each of the schools.

Attached you will find detailed information pertaining to the research project, including our essential question, how we proceeded throughout the three month process, our final results as it relates to student engagement and achievement in math, and a summary of successes and challenges.

Research Team:

Name	Board or Authority	Position	Phone Number
Leader:			
Patrick Bocking	NNDSB	Superintendent	(705) 472-7015 (5008)
Members:			
Gord Daniels	NNDSB	Coordinator	(705) 472-7015 (5012)
Jane Henderson	NNDSB	Coordinator	(705) 472-7015 (8288)
Patrick Duncan	NNDSB	Teacher	(705) 746-9333
Laura Thompson	NNDSB	Teacher	(705) 746-9333
Kam Nevrencan	NNDSB	Teacher	(705) 474-5720

Research Question: *Will the use of the SMART Board as an instructional tool lead to greater student achievement and engagement in math?*

The influence of SMART Board technology on student achievement and engagement in mathematics

Planned Strategies/Measures to Achieve Research Question	Performance Indicators	Outcomes Achieved	Expenditures
Meeting #1: Friday, April 4 th , 2008 – Overview of pilot project and essential question, strategies to achieve our desired outcomes, training on software, purchased technology components.		<p>Participants received basic training on the SMART Board and discussed ideas of technology integration and planning process in math.</p> <p>Participants engaged in teacher moderation and dialogued over student work in math.</p>	<p>(2) SB 660 SMART Board - 64 inch - FS 670 (2) Floor Stand for SB 660 -</p> <p>(2) WC6 - NA Wireless Bluetooth Connection -</p> <p>(2) Dedicated data projector.</p> <p>(2) Laptop</p> <p>Total cost: \$8987</p>
Planned Strategies/Measures to Achieve Action Research Question	Performance Indicators	Outcomes Achieved	Expenditures
Meeting #2: Tuesday, June 3, 2008 – ½ day meeting to finish up the training on SMART Boards.	Focused, targeted planning and instruction with SMART Board technology	Teachers finished with the SMART Board training and along with the support of the coordinators, planned focused, targeted lessons around the needs of their class. In their planning, both schools integrated SMART Board technology.	None
Planned Strategies/Measures to Achieve Action Research Question	Performance Indicators	Outcomes Achieved	Expenditures
Meeting #3: Monday, June 20 th , 2008 – Student surveys administered at the end of the focused instruction and technology integration at William Beatty and Silver Birches Schools.	<p>Student attitudinal surveys on QUIA</p> <p>Teacher and coordinator feedback on successes, challenges and potential next steps for 2008-2009</p>	Teachers engaged in powerful dialogue over student work and level of engagement. Teachers discussed the integration of technology into teacher instruction to increase the growth in student engagement and achievement in math.	None

Research Project Summary

We were interested in enhancing student conceptual knowledge in mathematics. We investigated the role of SMART Board technology in student learning in math to see if it could lead to greater student achievement and engagement. Data indicates that when students aren't actively engaged in mathematics education, their level of conceptual understanding is low.

From this, we developed a research problem. Through our initial research, we determined that technology has the potential to help students become more engaged and achieve better results.

Research Question:

Will the role of SMART Board technology in student learning in math lead to greater student achievement and engagement?

Hypothesis

We hypothesized that the use of SMART board technology will result in great student engagement and increased levels of conceptual understanding. Two pilot schools were chosen, along with their staff and students in the Intermediate division. A SMART Board was purchased for each of the schools.

Project Implementation Phase

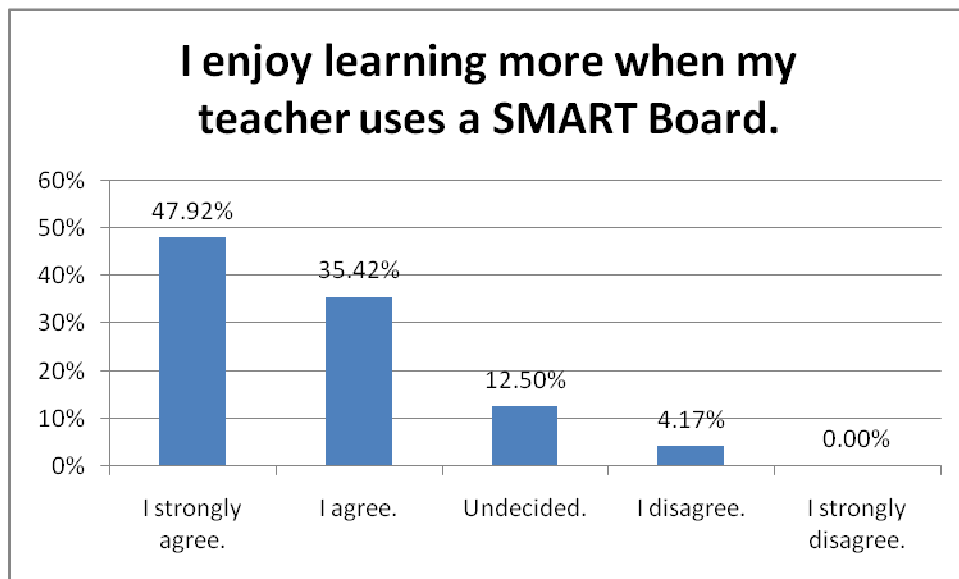
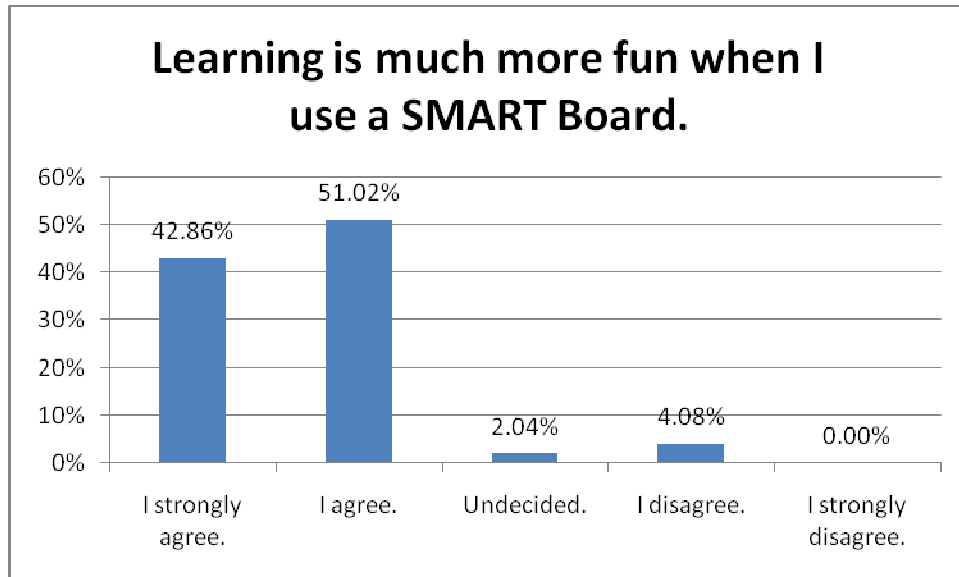
Throughout May and June, teachers actively engaged in learning opportunities using the SMART board in their instructional practice in each school. Feedback opportunities were shared among staff members to ensure continued support and student success throughout the project.

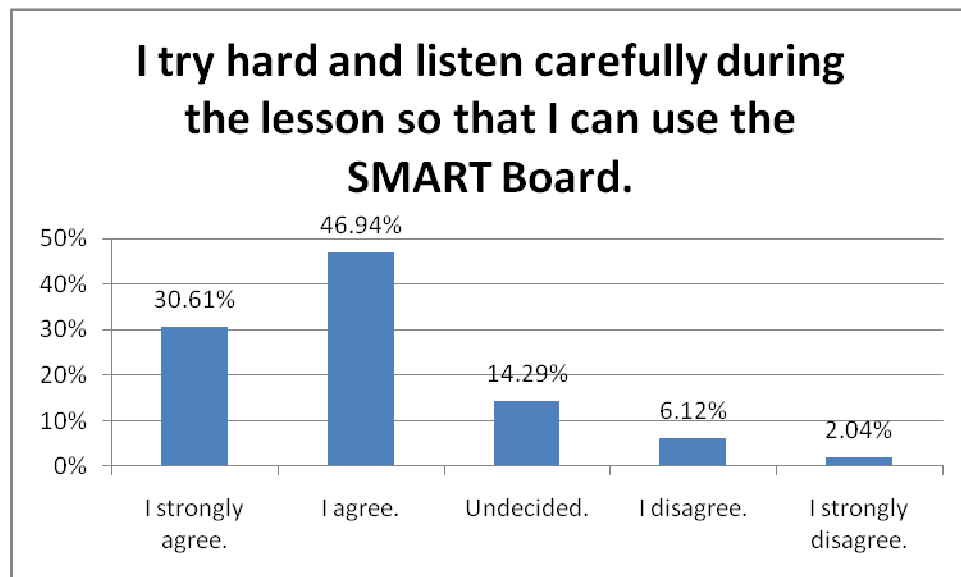
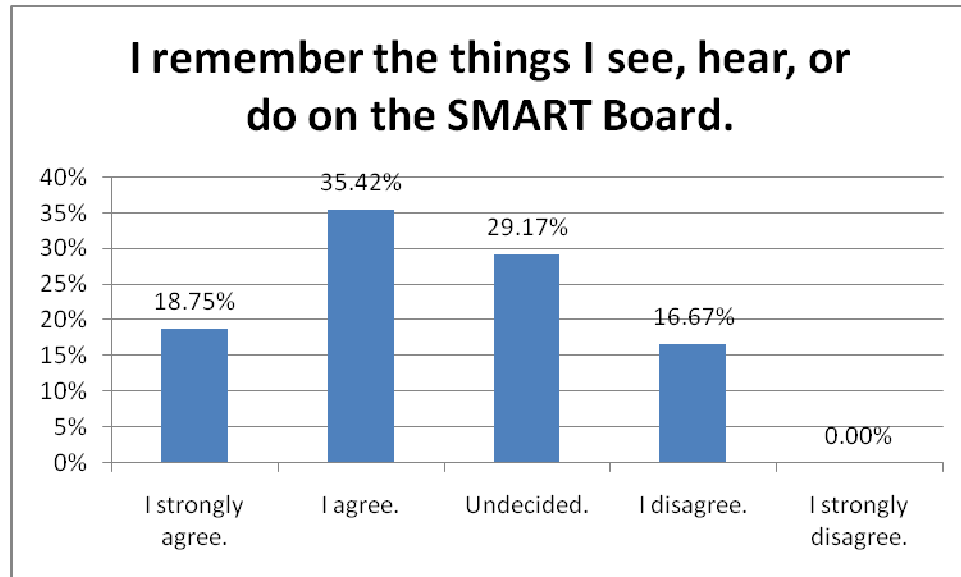
Data Collection

To prove our hypothesis, we collected the qualitative data, an attitudinal survey measuring students' interests, abilities and engagement while using the SMART Board. This survey was developed by the team and administered to all students from both schools using Quia. The results from this survey were gathered and analyzed for areas of strength and concern.

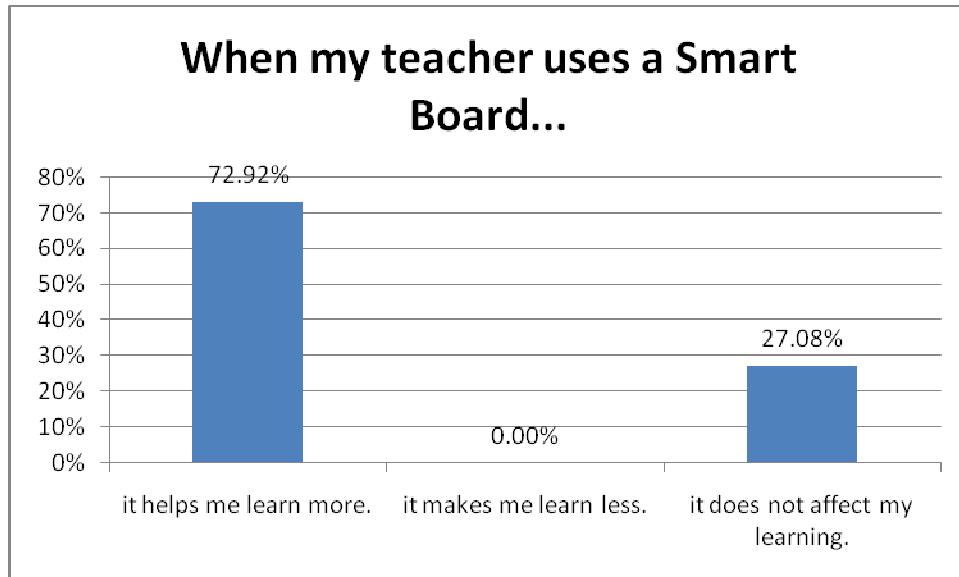
We also collected data from a teacher survey measuring their students' interests and level of engagement. The results from this survey were gathered and analyzed for areas of strength and concern.

Student Attitudinal Survey Results – 49 students responded





The influence of SMART Board technology on student achievement and engagement in mathematics



Comments by the students' experience with a SMART Board.

- my coment is that the smart boured are good for the scool class room.
- I like the smart board a lot because it is easier for me to learn with it.
- I haven't used the smart board long enough to decided whether I like it on not.
- i iove the smart bord
- I like it
- I like my teacher using to the smart Board. Because i learn more when he uses the Smart Board.
- I like the smart board it helps me learn more.
- I like the smart bored. It helps my learning, and it makes it way more fun! :) I think we should use it more oftenn.. :) i think they should lower the price of the smart bored, so our school can offord another one!
- I LOVE THE SMART BOARD!!!!
- I Love the smart bored, i think it's a great learning tool! :)
- i really like using the smart board it inhanses my work efort. i find i learn better on the smart board for a lot of resons such as i can i finally say wat i want to say <3 tonara
- i really like the smart board and it makes learning more fun and easy
- I really like the smart board! I wish I could buy a handheld one. L like doing art and science on the smart board!:]
- i think it is a good thing to have and it is very intersesting
- I think it is more fun using the Smart Board because we can work as a group and play games after.
- I think that the smart boraad is helpfull for sevral reason.To begin with.The smart borad could help other that have troble in math or other subject to so that might help others out. That i why i think the samar borad is helpfull
- I think that the SMART Board is a great thing and that it should be in every class room.

The influence of SMART Board technology on student achievement and engagement in mathematics

- I think that the smart board is alot of fun and it helps me learn alot more. I love when my teachers youse the smart board. I mostly love when mrs henderson youses it.
- I THINK THAT THE SMART BOARD IS HELPING ME LEARN BETTER
- I think that the smart bord is one of the best ways for me to laern and its easier to under stand things and learn
- i think the smart board is a fun way of learning but it doesnt affect much in comparison to a chalk board
- I think the smart bord is a great way to learn and I think it is better then chalk
- I think the smartboard is ok
- i think there should me moer smart boards il willium betty because they are really cool
- I think who ever created the smartboard is probably one of the most richest people on earth. I strongly agree that the smartboard helps us all learn more.
- it helps me to do my questions right way not the wrong way and its more fun to do it on the smart board then writing it down
- It show's what I don't understand when the teacher is talking about like component's or power number's mean(when the teacher writes it down on the smart board that's why I like the SMART board.
- It was cool.
- It's quite fun when we're playing games but I find it kind of annoying when we do certain things on some subjects.
- Its not That bad i just dont think its its far if people in class dont get to use it like me
- like ok, the smart board is cool and all, but i don't find it that big of a deal. other's think it's like so cool cause it's a touchpad, but i don't know.. it's ok. and i don't find it any more fun when my teacher uses it, nor do i think it makes me learn or pay more attention. it doesn't make a difference to me really. plus, it does take way longer than to just write it on the chalk bored. like, most of the time it gets messed up or something happens or the teacher can't figure out how to fix it, so we basically sit there for like 10 minutes while the teacher is trying to figure out what's wrong or how to fix the issue.
- smart boards rock and they're a learning experience you cannot pass up!!!
- The smart board helps me learn more sometimes becuse i acully listen .
- The smart board is a wonderful technology that kids can use now and i think in some parts in learning in school it makes them learn more and makes them want to learn cause of how it's designed. Well for me I like to use the smart board when the teacher uses the smart board i'm more intrestered but everyone's different.
- The smart board is fun for learning but it does not make a change I learn the same when I use chalk board and smart board but it is a good new learning style.
- the smart bord is betr because evrething is bigger
- the smartboard helps me alot when my teacher uses it. I think that it helps me alot during class.
- The use of the smart board, affects me in the way, that it sometimes makes it harder for me and others to learn. Most of the time the smart board does help but other times it doesn't help at all, it just makes it harded. Well using the smart board in class it makes it hard to learn because it doesn't always help, for the reason that it is always getting messed up. My other all impression of the smart board is not the highest because it is confussing and not that helpful, all though the smart is get it makes it harder to learn sometimes.
- using a smart board is very educational it helps in a couple of ways, u have lots of fun with it,

The influence of SMART Board technology on student achievement and engagement in mathematics

its interactive, and it could possibly help kids learn better! go smart board!

- using the smart board is fun. it makes no change in my learning though. It is also jus like a chalk board.

Overall, both schools showed a larger percentage of student engagement. A more detailed analysis of the results and possible follow-up with students and teachers is required to determine how this data can improve our practice both at the classroom and system levels.

Teacher Survey Results

Students enjoy using the SMART Board interactive whiteboard.

I strongly agree.	2
I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0

Students are more focused during lessons delivered on a SMART Board interactive whiteboard.

I strongly agree.	2
I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0

Students participate more in lessons delivered on a SMART Board interactive whiteboard.

I strongly agree.	2
I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0

I believe students have become more excited and motivated because of the SMART Board interactive whiteboard.

I strongly agree.	1
I agree.	2
Undecided.	0
I disagree.	0
I strongly disagree.	0

The highly visual nature of the SMART Board interactive whiteboard enables students to understand concepts faster.

I strongly agree.	1
-------------------	---

The influence of SMART Board technology on student achievement and engagement in mathematics

I agree.	2
Undecided.	0
I disagree.	0
I strongly disagree.	0
I believe student learning has improved as a result of having a SMART Board interactive whiteboard in the room.	
I strongly agree.	2
I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0
I can introduce more complex learning concepts when using the SMART Board interactive whiteboard.	
I strongly agree.	1
I agree.	1
Undecided.	1
I disagree.	0
I strongly disagree.	0
SMART Board interactive whiteboards cater for a significant range of learning needs.	
I strongly agree.	1
I agree.	2
Undecided.	0
I disagree.	0
I strongly disagree.	0
Being able to revisit previous lessons quickly enhances and reinforces prior learning.	
I strongly agree.	3
I agree.	0
Undecided.	0
I disagree.	0
I strongly disagree.	0
Being able to move text and graphics on the screen helps students learn.	
I strongly agree.	2
I agree.	0
Undecided.	1
I disagree.	0
I strongly disagree.	0
I enjoy teaching with a SMART Board interactive whiteboard.	
I strongly agree.	2

The influence of SMART Board technology on student achievement and engagement in mathematics

I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0
I can customize my lessons and adapt them to meet the needs of my class.	
I strongly agree.	2
I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0
I learn new things from my students because of the SMART Board interactive whiteboard.	
I strongly agree.	1
I agree.	1
Undecided.	1
I disagree.	0
I strongly disagree.	0
Teachers find the SMART Notebook software relatively easy to use.	
I strongly agree.	0
I agree.	3
Undecided.	0
I disagree.	0
I strongly disagree.	0
I feel comfortable using the SMART Board interactive whiteboard.	
I strongly agree.	3
I agree.	0
Undecided.	0
I disagree.	0
I strongly disagree.	0
My IT skills have increased because of the SMART Board interactive whiteboard.	
I strongly agree.	2
I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0
Staff are happy to share ideas and files that they have used on the SMART Board interactive whiteboard.	
I strongly agree.	2

The influence of SMART Board technology on student achievement and engagement in mathematics

I agree.	1
Undecided.	0
I disagree.	0
I strongly disagree.	0
Being able to reuse SMART Notebook files saves me time.	
I strongly agree.	2
I agree.	0
Undecided.	1
I disagree.	0
I strongly disagree.	0
I photocopy less now.	
I strongly agree.	3
I agree.	0
Undecided.	0
I disagree.	0
I strongly disagree.	0
I would like a SMART Board interactive whiteboard in my classroom permanently.	
I strongly agree.	3
I agree.	0
Undecided.	0
I disagree.	0
I strongly disagree.	0

Successes, Challenges, Next Steps for 2008-2009

The following information was gathered at our final teacher session on June 20th, 2008. The teachers discussed outlining *their* successes, challenges and next steps for this project *if* it were to continue into the 2008-2009 school year. This information will be valuable to the Coordinators and Senior Administration as they plan and prepare job-embedded professional learning opportunities for small groups of teachers throughout the Near North District School Board. Please note that this information has been summarized.

Successes	Challenges	Next Steps for 2008-2009
<ul style="list-style-type: none"> • Improvement with motivation and student participation in math with technology • Time to plan with colleagues • Use of technology • Opportunity to better focus teaching 	<ul style="list-style-type: none"> • Timelines were too short/ambitious • More time spent on teacher training • Difficult to fit this with extracurricular events such as class trips, track and 	<ul style="list-style-type: none"> • Extend timelines throughout the school year to allow for more job-embedded planning, reflecting, team teaching opportunities • SMART Board for each

The influence of SMART Board technology on student achievement and engagement in mathematics

<ul style="list-style-type: none"> • Modeling/teaching before students go in depth • Student motivation around the SMART Board • Receiving a SMART board • Job-embedded professional learning opportunity • Student growth and engagement in math 	<p>field, and graduation</p> <ul style="list-style-type: none"> • Time to meet for teacher discussion • Resources to teach math lessons • many students not engaged at the end of the year • Software for technology not available until the end of May • More planning time and implementation time • Coordinator support in the classrooms on a consistent basis 	<p>class</p> <ul style="list-style-type: none"> • More time to plan together for next steps • More time for training • Improve teacher resources
--	--	---

Participants remarked that they would like to see more job-embedded professional learning opportunities continue into the 2008-2009 school year, with a longer period of time to focus on the planning and implementation of instructional strategies, assessment and feedback, and dialogue around focused next steps for student achievement. All participants agreed that technology is essential in better meeting the needs of all learners in the classroom and school, and in providing engaging and interactive lessons to further deepen understanding of concepts taught in class.

 Superintendent of Education/Project Leader

Date

 Director of Education

Date