

Windsor-Essex Catholic District School Board: 2015 - 2016

Project Title	Using Technology to Increase Student Engagement in Mathematics by Doing Mathematical Tasks – “Math Talk”
Description	<p>In grade 7-10 math classes we are using iPads to try to get more student engagement in mathematics. When students show a high degree of attention, curiosity, interest, optimism, and passion in a topic they will be perform better in learning the topic.</p> <p>We use technology to get students doing math tasks and increase student engagement. With greater student engagement we are hoping our students will think about math concepts more deeply and learn them better than before. Through the use of several iPad apps, like Nearpod, SmartNotebook, Explain Everything and Virtual Manipulatives, we have found ways to focus on conceptual learning while providing formative assessment in mathematics.</p>
Context	<p><i>Number of students:</i> 480 <i>Number of teachers:</i> 20 <i>Number of schools:</i> 10 <i>Grades/Program:</i> Gr.7-10 Math</p>
Impact on Students	<p>Technology was used to increase student engagement and get students doing more meaningful math tasks. Ultimately, greater student engagement should reshape student thinking surrounding mathematics and lead to improved learning. Teachers and students were given pre and post project survey questions to assess the impact.</p> <p>20% of Grade 7 & 8 students claimed to use technology most of the time prior to receiving the iPads. After receiving the iPads, the percentage increased to 35%. In some pilot classes, there were enough iPads to have a 1 to 1 environment. In these classes, the overall impact of technology was more pronounced. 60% of Grade 9 & 10 students claimed they rarely used technology before receiving the iPads. This dropped to 31% after getting the iPads.</p> <p>Students claimed that the iPads made concepts easier to understand, more interesting and allowed for greater experimentation. When students were asked if math concepts were easier to understand with the use of iPads, 53.5% of the students responded “Much” easier with only 16.8% stating the iPad did not make it easier. 59.4% of students responded that learning math concepts was “Much” more interesting than without iPads. 86.5% of students responded they felt the use of the iPad allowed them to experiment with math concepts and allowed them to learn, understand and apply the concept as opposed to memorizing it.</p> <p>The Board compared responses from the beginning of the class prior to the introduction of the iPad Math Program and found that there was a 13.8%</p>

	<p>increase in students thinking about math concepts outside of class. Students also responded 52.5% really enjoyed their math class which was a 12.7% increase from their last experience. Although this enjoyment is a by-product of good teaching and understanding of concepts, the Board is also seeing an improvement in EQAO scores with schools in the program. The Board performed an analysis of combined EQAO data from all the classes involved and compared the 2013-14 data to the 2014-15 data. The analysis revealed that the overall average increased from 63% to 67%. The two most striking findings were failure rates dropped from 20% to 11% and the % of students that achieved over 80% went from 23% to 28%.</p>
<p>Impact on Instruction</p>	<p>A number of highly motivated teachers stepped forward to embrace the learning and as a result a new grass roots approach to teaching Math Concepts has evolved.</p> <p>The use of technology has made concepts a reality with practical examples. Less preparation time is required for difficult lesson planning. Teachers have more time for student support and program development. 91% of teachers responded that they used a LCD display to show what they were doing in math class at the beginning of this project. At the conclusion of this project, LCD use went down to 41.7% for a difference of 49.3%. Teachers were no longer substituting the LCD for a chalkboard but began modifying and redefining assignments with the iPad and the associated apps.</p> <p>Teachers are spending more time facilitating instruction rather than just delivering instruction. 66.7% of teachers reported they are “quite a bit” more comfortable using the iPad to teach math concepts. 66.7% of teachers reported they never or rarely used technology in their classes at the beginning and now 50% of teachers are using the iPad to assist learning on a daily basis. Most teachers have moved very quickly from the substitution level of iPad tasks such as, watching a Math Video or using it as a calculator to much more robust activities. After integrating the iPads into their lessons teachers found that the largest use of the iPads and greatest benefit focused on conceptual understanding, investigation and use of virtual manipulatives.</p> <p>Continuing with this grass roots effort, our teachers have formed a Google Plus community called “LSA Math with iPads”. Teachers use this community to share ideas on technology use for teaching math concepts. Teachers also support themselves by posting demos, pictures of the activities occurring in their classes and problems that have occurred.</p>
<p>Impact on System</p>	<p>This project is still very new and just starting to take hold and flourish. A significant impact has been made with students in the program after only two years of piloting. EQAO data for test schools is extremely encouraging.</p>

	<p>The Principals involved in the project are very enthusiastic with the results so far and are spreading the word and creating an increased demand for the “<i>Math Talk</i>” program and the resources that have been created. Future funding will guarantee program expansion and will provide other students with the opportunity to conceptualize their thinking and lead to enhancing overall achievement scores.</p> <p>The increased use of technology has helped in the development of new Information Technology Policies and continues to put pressure to improve overall infrastructure across the system.</p> <p>The Ministry has also given the Windsor-Essex Catholic District School Board a grant to host a South Western Technology Symposium in the fall and the Board looks forward to working with all the regional Boards to make this day a huge success.</p>
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