

# IMPLEMENTING TECHNOLOGY IN THE MATH CLASSROOM

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## TECHNOLOGY

"Practical use of knowledge particularly in a specific area and is a way of doing a task, especially using technical processes, methods, or knowledge" (Ahmadi, 2018).

We have learned so much, even in just the past five years, about how to use different and new technologies.

Technology can be used as a mediator between engagement and distractibility in the classroom.

There are so many different ways to implement technology in the classroom.

Students will be more interested if you are able to differentiate the ways you are giving instruction.

## WHAT DO I HOPE TO GAIN FROM MY RESEARCH?

- This inquiry project is aligned with criterion 2 on the Washington State Teacher Evaluation Criteria.
- Emphasizes the need for teachers to demonstrate the use of effective, research-based instructional practices to meet the needs of all learners.
- From my research I can now bring a new perspective on using different technologies in the classroom.
  - How to effectively engage the students.
  - It also allows me to help provide the students with technology that can help them better understand math.
  - In what ways does technology make learning easier?
  - Help students explore the different uses of technology and how they can be incorporated in different ways to learn.
- Students don't want to listen to me give them notes and work problems every single day. Technology, is consuming the next generation of students. By implementing these technologies in my classroom, I can provide students with another window into the wide world of technology.

"If we teach today as we taught yesterday we rob our children of tomorrow"

—John Dewey 1916



## RESEARCH QUESTION

How does technology impact student understanding and engagement in the secondary mathematics classroom?

### Technology Available to Educators

- Screencasting
- Adaptable online programs
- Computer activities/games
- Classroom Lessons Applications (ex. Doeceri)
- Recorded Lectures/Online Videos

### BLENDED LEARNING:

A style of education in which students learn via electronic and online media as well as traditional face-to-face teaching.

413 Total Sixth-Graders

205 students participated in a blended learning environment

208 students learned via face-to-face or a more traditional teaching approach.

Comprised of students who were in math classrooms where blended learning took place almost every day

Consisted of students who were in classrooms where the teacher primarily used face-to-face instruction. Technology may have been used in these classrooms, but it was primarily used by the teacher as an instructional tool. The lesson typically ended with a quiz using paper and pencil.

Students rotated in small groups between:

- Teacher-led instructional activities
- Project-based activities or independent tasks
- At least 10 minutes of learning from online digital content that was self-paced and adaptive based on real-time data

A typical lesson included the teacher introducing the concept to the whole class and modeling sample problems, followed by students doing independent or group work solving problems and quizzes.

Students who were taught in a blended learning environment during sixth grade, compared to students learning face-to-face in sixth grade, had higher sixth-grade test scores. They also had higher final eighth-grade test scores in the current study two years later.

### Teacher Perspectives on Technology:

- Teachers generally view technology as both beneficial and detrimental to student learning.
- More training for teachers and students is deemed necessary to effectively implement technology in the classroom.

### Student Engagement and Comfort with Technology:

- "Research shows that while growing up in the ever-growing technology world, the incorporation of technology helps motivate students to learn"
- The familiarity of students with various forms of technology indicates a digital community upbringing.

## 1:1 TECHNOLOGY-

1:1 technology is a technological movement of every child in the classroom, school, school district, etc., having a laptop, or device, in the classroom to manipulate and learn with as a tool.

One study I found consisted of fourth graders in two different classrooms in the same Title 1 school in Central Illinois. The goal of the research was to measure student achievement and motivation. They had both classes take Topic Tests in math as well as discovery assessments in math in order to measure and record results. The results varied depending on the time of year.

Name of Test	1:1 Implementation Classroom	Traditional Classroom
Topic Test 1	78.26%	68.16%
Topic Test 3	82.58%	65.87%
Topic Test 4	72.35%	70.67%
Topic Test 5	67.05%	78.81%
Topic Test 6	71.53%	82.24%
Topic Test 7	71.30%	73.95%

TABLE 1 – STUDENT'S TOPIC TEST SCORES

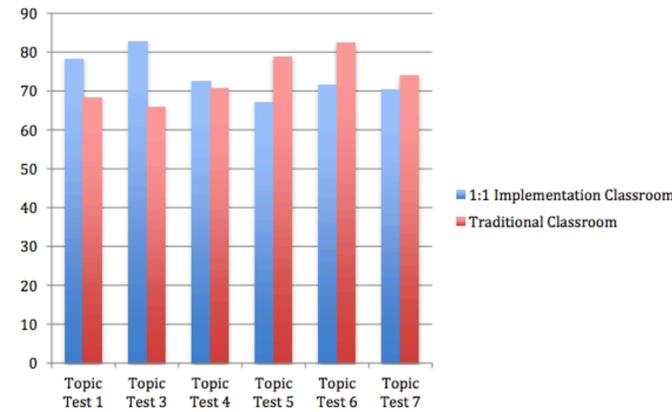


FIGURE 1 – STUDENT'S TOPIC TEST SCORES

### Student Reliance on Technology:

- A significant percentage of teachers believe that students heavily rely on technology.
- Figure 2 shows how heavily teachers believe students rely on technology.
- Despite this reliance, students are familiar with other research and learning models.

### Challenges and Concerns:

- Teachers expressed the need for more technology training and support to address implementation challenges.
- Some teachers lack confidence in utilizing technology effectively in the classroom.

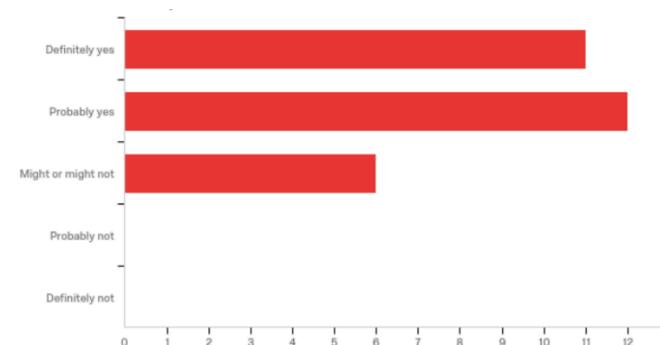
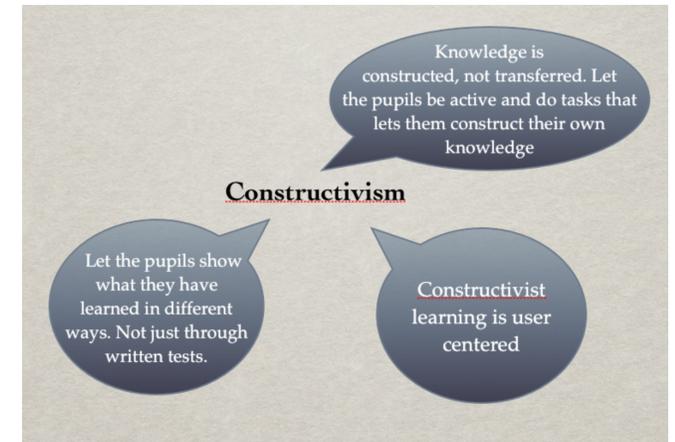


FIGURE 2 – STUDENT'S RELIANCE ON TECHNOLOGY



<http://languageeducation.pbworks.com/w/page/61169462/Constructivism>

## THEORY AND TOOLS

Teachers adopting constructivist approach tend to use educational technologies more frequently in their classes and try to include their students more in the process of teaching.

Name	Purpose	Website	iPad Availability	Classroom Use
Blogger	Communication	www.blogger.com	Yes	Allows the user to create and read math blogs.
Flipped Classroom	Instruction	http://www.knewton.com/flipped-classroom	NA	Allows class time to be used for activities and projects because students view instruction at home.
GarageBand	Production/Assessment	www.apple.com/itunes/garageband	Yes	Encourages verbal communication through math projects.
GeoGebra	Production/Assessment	www.geogebra.org	No	Promotes geometry understanding.
Gmail	Communication	mail.google.com	Yes	Allows user-friendly e-mail communication compatible with other Google applications.
Google Docs	When Technology Filters	www.docs.google.com	No	Allows the sharing of documents with teachers and peers.
Google SketchUp	Production/Assessment	sketchup.google.com	No	Provides three-dimensional drawings; many features.
Google Talk	Communication	www.google.com/talk	Yes	Provides online communication through chat in which students can instantly communicate with peers and teachers.
iMovie	Production/Assessment	www.apple.com/itunes/imovie	Yes	Encourages communication through video sharing.
iXL Math	Production/Assessment	www.ixl.com	No	Offers in-depth feedback to students.
Khan Academy	Instruction	www.khanacademy.org	Yes	Offers instruction for all ages and concepts through video.
National Council of Teachers of Mathematics (NCTM) Illuminations	Manipulatives	illuminations.nctm.org	No	Provides applets and activities aimed at developing mathematical understanding.
National Library of Virtual Manipulatives (NLVM)	Manipulatives	nlvm.usu.edu	No	Provides virtual manipulatives at no cost.
TeacherTube	Instruction	www.teachertube.com	No	Allows for educational videos and podcasts.
TweetDeck	Communication	www.tweetdeck.com	Yes	Organizes tweets into multiple categories for teacher and student use.
Twitter	Communication	www.twitter.com	Yes	Provides a way for students to subscribe to different mathematics-related accounts to receive instruction, help, problems, a look into math careers, and many other options. Teachers can use this tool to share classroom ideas with one another.
YouTube	Instruction	www.youtube.com	Yes	Provides videos that can be searched on a variety of math-related topics.

Tools for Educators and how they can be applied to a classroom

## MOVING FORWARD

Most of the case studies on blended learning had discussion about the fact that towards the latter half of the school year students tended to slip back below the traditional instruction methods. Students might begin to lose interest if the teacher becomes over reliant on technology. Find a balance!

If technology is available, it will be important for me to ensure I know how and when to use the tech that is available. Even though I am young and with the times

It will be important for me use my resources and find the most useful ways to effectively incorporate technology to make learning and teaching easier

REFERENCES -

