Tools & Technology for Mathematics Instruction

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What is this Session Regarding?

- Technological Pedagogical and Content Knowledge (<u>TPACK</u>)
- Examples of the integration of instructional technology to aid in the teaching and learning of secondary mathematics will be shared.
- Recommended books:
 - <u>Teaching Math with Google Apps: 50 G Suite Activities</u>, Alice Keeler & Diana Herrington, 2017, Dave Burgess Consulting, Inc. ISBN 978-1946444042
 - Focus in High School: Technology to Support Reasoning and Sense Making,
 Thomas Dick, Karen Hollebrands, Publisher NCTM, 2011. ISBN 978-0-87353-674-5

Apps, search tools, & other tools

- Google apps such as Google Forms
- Diamond App for the Ipad
- GeoGebra
- Search engine for math teachers <u>http://www.fishing4tech.com/mtbos.html</u>
- <u>LaTeX</u> Math Typeset program
- Wolfram Alpha https://www.wolframalpha.com/

Wolfram Alpha

Pro

for Students

Starting at \$4.75

SELECT

KEY FEATURES

- Step-by-step solutions
- 😊 Web Apps Education Collection
- Access Pro capabilities in Wolfram Problem Generator
- Coming soon: unlock additional features for the iOS app

Pro Premium

for Students

Starting at \$7.99

SELECT

KEY FEATURES

- All Pro for Students features plus
- Extended computation time
- Reference, Professional & Personal Web App Collections
- 🤛 Increased upload size limit
- M Pro Premium Expert Support

Technology Misuses/Overusage

• "The constant checking of mobile devices has triggered a wavelet of recent classroom technology bans, especially at the collegiate level. For instance, in 2017, after two separate studies out of West Point found that students who used laptops in class received poorer grades, the lead researchers of the studies banned computers from their classrooms." (Berdik)

Nearly a third of U.S. teens use electronics to cheat(Noguchi)

Student Response Programs/Apps

- Kahoot! Synchronous timed questions
- Quizizz –Can add symbols your questions
- Quizlet Live –Teachers can create collaborative learning games
- Plickers Students use cards and teacher can use ipad or phone to scan for students responses to multiple choice or true false questions
- Padlet –A collaborative space for teacher and students to share information, resources, images, and items that need review and reinforcement
- Flipgrid –Teachers can create grids and post topics for students to reflect on
- Formative has less of the gamification and open-ended response option
- Flubaroo can be linked with Google Classroom
- Other

Overviews of technology tools used in the teaching of secondary mathematics

Many of these come examples come from teachers that have been enrolled in a technology course offered online.

PhET and Gizmos

TI Nspire Overview

Desmos

Desmos

• "I started using Desmos Activities in February. The students have given great feedback. Mainly I have used activities written by others. But I did have a class do one activity written by me and it went well. It is amazing how easy it is to put together and I will be writing more in the future. But that doesn't mean I need to reinvent the wheel, the site has many good activities ready to use in the classroom."

High School Math Teacher, April 2018

Customizing Technology Tools

- Creating your own <u>Desmos activity</u>
- Create your TED-Ed lesson, https://ed.ted.com/videos
- Factoring a Trinomial using the AC Method

https://ed.ted.com/on/1woKGBcZ#watch

Recommended Website

- http://www.statisticsteacher.org/
- https://photomath.net/en
- https://teacher.desmos.com/
- http://patrickjmt.com/ & http://www.virtualnerd.com/_&
- https://www.khanacademy.org/
- https://illuminations.nctm.org/

- K-12 Teachers Get Free Trial
 Memberships to Statistics Teacher
- Be aware of free apps that show the work you think students may be doing.
- Desmos is the cat's meow
- Sites with math tutorial videos
- Nice mix of apps and lessons

Formative Assessment Tool Sites

Kahoot! - https://kahoot.com

Quizizz - https://quizizz.com

Quizlet Live - http://quizlet.com/live

Padlet - https://padlet.com

Flipgrid – https://info.flipgrid.com

Formative – https://goformative.com/

Flubaroo - http://www.flubaroo.com/flubaroo-user-guide#step1

Sources

- Berdik, C. (2017). Dealing with digital distraction, The Hechinger Report, retrieved Jan 23, 2018 from http://hechingerreport.org/dealing-digital-distraction/
- Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? Contemporary Issues in Technology and Teacher Education, 9(1). Retrieved from http://www.citejournal.org/volume-9/issue-1-09/general/what-is-technological-pedagogicalcontent-knowledge
- Noguchi, S. (2017, Aug. 6). Nearly a third of U.S. teens use electronics to cheat, survey says. The Denver Post. Retrieved from http://www.denverpost.com/2017/08/06/us-teens-electronics-cheat/

Questions/Comments

Thank you

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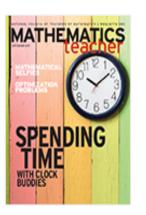
http://web.mnstate.edu/harms/

Math 515 - Tools & Technology for Secondary Mathematics

https://www.mnstate.edu/18online/content-areas.aspx



The Mathematics Teacher / Vol. 111, No. 1, September 2017 / A Tale of Two Slider...



JOURNAL ARTICLE

A Tale of Two Sliders

Janet Walker and Michael Todd Edwards

The Mathematics Teacher

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