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Technically speaking

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Guest Column

We are living in a time when technology is changing almost faster than we can adapt. New products and upgrades are marketed at a startling pace. The level of complexity associated with some of the latest technology is so great that a product is not fully implemented and absorbed before its next generation is on the market. The third version of the iPad was unveiled while users were still purchasing the iPad 2. The diversity and depth of technology available to us are increasing at a seemingly exponential rate. This is particularly true in mathematics. In the late nineties and early part of this century, many new programmable graphing calculators (Casio, Hewlett Packard, Sharp, and Texas Instruments) were introduced. These new tools were powerful additions for the mathematics and science classrooms. The potential to unlock powerful teaching and learning seemed to have arrived. Calculator wars began, not only with respect to which brand of calculator but when these new devices should be used. Every time a new calculator was unveiled, the debate continued. The irony is that many classrooms did not fully utilized the power of the new hand-held tools available to students at this time. Why is this the case? In the last two years, the powerful push of tablets including the iPad, Xoom, TAB and Nexus has created a drive for hand held computer technology in the classroom. The technology arrived but have the educational applications for these devices followed this road-runner pace?

People in all walks of life will need a higher level of proficiency in mathematics and science because of the demands of our technological times. Mathematics is a key to the door of opportunity as students decide

about careers, learn to make informed decisions, and function as self-motivated, lifelong learners. "Working smarter" is replacing "working harder" mathematically, particularly where more menial tasks (arithmetic would be included here) are concerned. In working smarter, individuals must be mentally fit to absorb new ideas, adapt to change, cope with ambiguity, perceive patterns, and solve unconventional problems (MSEB, 1989). This was an expectation in the late 1980s and continues more than 30 years later. Have we used technology to embrace the idea of "working smarter" or do we continue to debate what technology should be used inside and outside of the classroom? Are we using technology to enhance teaching and learning? Have we embraced new technology for the benefits of our students? Are we pushing ourselves to examine new technology to create a greater learning environment? If not, what is stopping our community of educators from moving forward?

Should we embrace the movement and work to integrate technology into the curriculum? "Two parallel stories are told about a man and a woman. The man learned his arithmetic by doing hand calculations. As advances were made either in the ways in which the calculations were done or the materials available to do them with, the man clung to 'his' way of doing things—by hand, using paper and pencil only, no matter the size of the numbers. He persisted through the advent of the calculator, computer, and all other sorts of technological advancements that would have reduced the demand on his manual efforts. After all, he knew how to do it that way—why learn something new? At the same time, the woman, who was a master cook, learned on a wood stove but progressed through the innovative developments. Each new technological advancement was found in her kitchen during its time—gas stove, electric oven, convection oven, and a microwave oven. Certainly she could have continued with

the wood stove as her major cooking tool, but she opted to change with the times. Using the most efficient tools for the task, she can achieve the desired result in the least amount of expended effort." (Rock & Brumbaugh, 2013, p. 90)

Do you know colleagues that do not have a cell phone? Do you use your cell phone to check e-mail or access the Internet? More importantly, do you allow your students to use mobile technology to do the same in class? Are students encouraged to use smart-phones and tablets in classrooms? Are we impeding progress by limiting access to technology in the classroom?

The creation of the mobile technology (Smartphones, iPad, Xoom, Kindle Fire, Galaxy Tab, Nexus etc.) have created the drive for powerful, hand-held technology for business and education. Ten-inch and seven-inch tablets are becoming a common multimedia tool for video, audio, and communication via e-mail and social networks. In addition, these ten- and seven-inch devices have powerful counterparts that fit in the palm of the hand. Portability and accessibility has become a driving tool for much of the newly developed devices. The hardware seems to go through new generations faster than the applicable software applications can keep pace. Hundreds of new applications are being created for these new devices. The question is how can these new applications be used for teaching and learning? If this is the case, why not allow students to use smartphones in class using apps that promote learning. These devices can run full motion video allowing students to watch tutorials. These devices give students the ability to communicate and share information with teachers and students. Applications powered by Google (Google Drive - http://drive.google.com) allow users to create, share, and edit documents, spreadsheets, presentations and forms all compatible with Microsoft Office products.

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 Does your school use clicker response systems? Using the site PollEverywere (http://www.polleverywhere.com/) and a basic cellphone, you can replace hand-held clickers. Poll Everwyere is a free, Internet-based application that allows educators to create live, interactive polls in the classroom. The teacher is provided texting codes one the website that allows students to submit poll answers using cellphones to text responses directly to the site. Graphs are dynamically updated as responses are received.

Do you try to encourage your students to take notes in your class? Do you allow your students to create a shared document for class notes accessible by all students? A document in Google Drive can be viewed and edited by each student in the class simultaneously while participating in your live classroom. Are students spending more time hand writing notes than absorbing the concepts you are teaching?

Are these ideas limited to just the college environment? How many middle and high school students have cell phones? Are cell phones limited by socioeconomic status? The next time you are in a high school classroom, poll the students: How many of the students have cell phones? How many of the students have smart phones (ability to access the Internet). In less than two years, it will be very difficult to find a non-smartphone. If this is the case, how will you handle this in your class? If you are a student teacher or current educator, are cell phones allowed in the school where you teach? Should cell phones be allowed in class?

Think about this for a moment. If all cell phones will be smart phones in two years, this means that all cell phones will have access to all of the educational applications available for hand-held devices. Think of the power in the hand of the student.

With all of the possible teaching and learning opportunities using portable technology, how can we afford to ban the use in the classroom? Please remember, 12 years ago, many schools were searching for reasons to use or ban the Internet in schools. Educators were fearful of the negative possibilities of using the Internet.

As we are asked to constantly improve teaching and learning, we must find ways to engage the entire community to work together to provide effective training and guidelines for technology usage in schools? As educators, it is our task to examine the teaching and learning tools for our students. The job is yours…….but the excitement and reward will be our students'.

References

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