The Role of Technology in Education

Research Paper

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EDUC 580

9.25.2014
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Technology is a tool that educators should be integrating into their classrooms to help students achieve success. While many of today’s teachers are not as familiar with some technologies as their own students, it is still crucial for adaptations to be made so that students have the best possible chance to excel academically. Some more established teachers are currently struggling to realize that they do not need to change their entire pedagogy or curriculum to meet the needs of their students but rather they need to make changes to incorporate technology into their classrooms for the students benefit. The most important factor with the advances made in technology, should be for every teacher to make appropriate changes to their teaching style to reach every type of learner in their classroom. The role of technology in education is quite important, especially with new advances being made every day. With technology being more available than ever before, teachers need to be aware that they are targeting a new type of learner entirely. While the traditional method of the teacher introducing new topics and assisting with practice material is still relevant in the classroom, students today also connect with mobile learning. Almost every student in schools these days have a Smart Phone or a Tablet or a Laptop and the teacher should find ways to incorporate these items into their instruction. Currently, there are endless applications for students to download or use to help in any area of their education. The truth is, some of the learners in our classrooms will learn better from using their own devices and downloading different apps. With these tools, educators can focus on making learning better for every one involved. Even more so, with these new technologies teachers need to be aware that curriculum changes are in order as well. The curriculum should not be changing because of the technologies
incorporated into the classroom but needs to be updated due to the new type of learners in schools. By addressing the issues in schools and making the relevant curriculum changes all students will be able to find success in any content. As far as teaching secondary math goes, there are plenty of applications and resources that technology allows to incorporate into the school day. By making the necessary curriculum changes in mathematics, we can incorporate tools, such as Khan Academy, to empower our students. The most important thing teachers can do today, is accept that technology advances are here and if teachers take the time to incorporate new tools, students will not only be grateful but they will do better.

In today’s classroom, students are experts when it comes to technology while their teachers may not be as proficient. “Having grown up immersed in technology, the students of today are digital natives, but many of their teachers are often playing catch-up because they are digital immigrants” (Hammonds, Matherson, Wilson, & Wright, 2013). Consider paraphrasing. With these “digital natives” entering the classroom rapidly it is important to adapt to their learning needs. The first factor teachers can incorporate into their tech-savvy audience is through the use of mobile learning. It is not often that a student enters the secondary classroom without having some type of Smart Phone, or other “Smart Devices” including, but not limited to, iPods, iPads, and Tablets. The classroom has changed greatly from when the only tool students were typing on in class was their calculators, which students will argue they no longer need because they could replace their scientific/graphing calculators with their phones as well. Many years back, students weren’t even allowed to use calculators on assessments of any kind and that has adapted to teach students to use it as a tool to understanding the mathematics concepts,
well working with mobile learners should be somewhat similar to that change. Instead of being fearful of what comes with these new technologies, “Educators can utilize this technology so that academic learning translates to real-world applications” (Pilgrim, Bledsoe, & Reily, 2012). For the unfamiliar teacher, finding relevant tools is just an iTunes Store or Google Play Store search away. While it may take some time to sort through and become proficient in different applications there are unlimited free resources teachers could use for the students benefit. Student’s today would be more inclined to do homework that is based off of something they could do right on their smart phone verses being required to refer to an old outdated textbook and answer questions. At least their smart devices can hold their attention longer. Designing and implementing new technology-powered programs are setting up students up for a greater chance at success. Currently resources such as Dropbox, Class Dojo, Evernote, Social bookmarking, Emodo exist that can be relevant in any type of classroom (Hammonds, Matherson, Wilson, & Wright, 2013). These tools help the teachers in providing students alternate methods to handing in work and keeping their notes organized while also managing behavior and monitoring students’ understanding. Any classroom would easily be able to incorporate any of these tools and there are unlimited amounts of support made accessible to educators. While changes such as these may be overwhelming to current teachers, “It is important to remember that tech tools are just that - tools. They are not the ends in and of themselves but the means for assisting teachers in making instruction better” (Hammonds, Matherson, Wilson, & Wright, 2013). It should be seen as a more exciting time for teachers, now having tools to assist in their profession, more than ever before. I cannot stress how important it is for teachers to recognize these tools and to find the best
way to incorporate them into their classrooms for the benefit of their students. “For true change to take place in the classroom, the paradigm shift must begin with the teachers rather than the students” (Hammonds, Matherson, Wilson, & Wright, 2013). The students are already adapting to these technology advances because it is second nature to them. Educators must be aware that with this new breed of learners, it calls for an evaluation of the current curriculum and potential updates and changes must occur to the curriculum for the chance of student success.

In order to keep content relevant up to date and meaningful it is crucial to always be making changes to the curriculum. Whether it be from past experience, or what worked better in a different classroom, or simply to incorporate new learning styles to benefit the students, it is necessary for the curriculum to always be monitored. Great debates have been brought to attention, trying to determine who is the best candidate to make these curriculum changes. In a case study, the authors described, “One of the project’s underlying goals was to investigate how well Ohio State University’s Systematic Curriculum Instructional Development (SCID) and Developing a Curriculum (DACUM) processes functioned as methods for creating competency-based curriculum and instructional materials in largely interdisciplinary environment” (Sologuk, Stammen, & Vetter, 2001). While DACUM was relatively new at the time of this study, it had been successful in analyzing occupations at the professional, technical, skilled, and semiskilled levels. DACUM runs strongly on incorporating experts in the design, so when they were attempting to integrate multimedia into the classroom they had someone who was an expert on multimedia information but also teachers. Teachers are the experts in curriculum writing because they know what they need to teach and when is the best time
to teach it. The only thing that should be changing in the curriculums in schools today is
that teachers should be coming together and collaborating on what can make the
curriculum better. Educations is always going to be a field of change, teachers should be
excited about these changes because hopefully they are making strides in the right
direction for student success. The positive thing about teaching is that so many experts
work in the same building, or district, or even around the world. With fellow experts the
next classroom over, collaboration is amazing to help each educator grow and adapt to
new ideas and new advances in technology. Teachers must remember no matter what
educational advances or struggles come from technology, they are still the experts in the
field because they are the ones with the degrees on the content and they are the ones with
the experience teaching. No corporate technology specialist could tell them how to do
their job better than they have already mastered, but there is room for improvement. With
this technology, it is important that teachers are willing to accept these changes. The
more open teachers are to the changes, the more success they will have at incorporating
new learning techniques into their classroom. It is most important that educators
remember the curriculum change is not a personal attack on their work, but rather an
update to help students succeed. “Instead of leading with an idea of how to use
technology, both agree (Papert & Patrick) that schools have to decide what they want
children to learn and then integrate technology into these new models” (Pascopella,
2005). While these curriculum changes are arriving after new advances have been made
in technology, the goal is still the same, to use technology as a tool to incorporate into the
daily learning of students but still teach. Technology should not be the major role of
education today but rather it is a tool after experts, the educators, decides what they are
going to teach. According to Pascopella (2005) “Technology is a catalyst for educational transformation. Technology enables a kind of collection of data about students that can make possible formative and diagnostic judgments to improve instruction”. Technology may be the enabler to these changes, but there are certainly relevant changes to be made. As quoted in New Technologies in the Classroom, John Dewey once said, “If we teach today’s students as we taught yesterday’s, we rob them of tomorrow” (Pilgrim, Bledsoe, & Reily, 2012). Today’s students do not learn the same way as the previous students. We are currently in a new era especially for education, so advances in our content must be made with these new technologies. We cannot teach students the out of touch methods we used in the past but rather we must adapt to their way of learning and make the content relevant to them. “The constant point is how to make it a real experience for youths so the learning holds meaning for them” (Pascopella, 2005). While technology may have fueled necessary changes, it should always be referred to as a tool. “Technology is then used to support quality learning” (Pascopella, 2005). Educators are still the experts, they are not being replaced by the technology emerging, but they need to work with the technology as a tool after they form a solid curriculum. Once the curriculum is in place, technology can be used to teach the students what the educators want them to learn.

As we have discussed, with technology comes an updated curriculum that also creates a new type of classroom. Typically, secondary mathematics classrooms follow a certain routine. The classroom is organized, where desks are in rows, facing the board and teachers are at the board introducing new topics and then give students a chance to work independently or in small groups to solve problems. Besides the vast amount of
applications and resources that can be used in mathematics, there is a new concept that is taking storm in mathematics known as Khan Academy. Khan Academy is an online resource, started by Salman Khan, which is primarily made up of three components: videos, exercises, and data. The videos teach students how to preform different mathematic skills and then they go on to try the exercises, while data is collected on their performance. The exercises are unique to every student so no student will ever be on the same question at the same time and there are unlimited amounts of exercises. To be deemed a master of a skill the student must get five questions in a row correct. The questions do offer hints if they are stuck but they would have to start over and would not receive mastery if they clicked hint. Students using Khan have the ability to work at their own pace and cannot move ahead without mastery on a topic. What is even nicer is that since students cannot be on the same question at the same time, if they ask their peer for help you cannot just give them the answer, instead the students talk through what needs to be done to solve the question. Instead of just copying their neighbors’ answer they actually learn what they need to do in order to solve the problem. Khan additionally provides students and teachers with real time reports that way teachers know exactly where what students are struggling and what they should spend more time going over. “For teachers, having such rich data about their students’ progress at their fingertips enables them to spend time with students in the most efficient and effective ways” (Khan & Slavitt, 2013). While all of this information sounds amazing, it is important to realize that all of that positive information about Khan Academy was coming from Salman Khan, the director, himself. Obviously, there could be some bias opinions to his work. Addressing that issue, Light and Pierson decided to study classrooms using Khan
Academy and see if they lived up to the words of Salman Khan. In August of 2013, the researchers traveled to Santiago, Chile to conduct their research on eight middle school math teachers from five different schools. The researchers state, “We wanted to examine how Khan Academy is merging and blending with teachers’ classroom practice by interviewing teachers about their use of Khan Academy resources and capturing their reflections on that use” (Light & Pierson, 2014). Their research was based on Vygotsky’s (1978) socio-cultural theory of learning, believing that learning comes from interactions with other people and tools play a fundamental role. The schools were chosen from a non-profit school network called Sociedad de Instrucción Primaria (the Society for Primary Instruction, SIP). The eight math teachers were working to incorporate Khan Academy into their curriculum. “The goal of this study was to document the types of teaching and learning practices that Chilean teachers are developing around this popular new learning platform as a means to better understand the tool’s role in an emerging market context. We did this through interviews, focus groups with students, school walk-throughs, and classroom observations” (Light & Pierson, 2014). They observed 25 math lessons but none of the schools has a sufficient amount of computers so those lessons took place in the school’s computer labs when they were working with Khan Academy.

The Chilean school day differs from most American school days, as they are there from 8A.M. to 3P.M. but the students’ stay in the same class all day with the same peers and the teachers are the ones who rotate. In these classrooms, the Chilean teachers incorporated Khan Academy as a tool to help the students learn but never relied on the platform to be the direct instructor. Khan Academy was used as a tool, with its’ endless amount of exercise to help students become fluent in their skills. The researchers found
that students would skip the videos and hints because they would rather get their
information from peers or their teacher, and they then became more comfortable asking
questions. An amazing thing that happened was when students asked their peers, “peers
became facilitators rather than answer sheets” (Light & Pierson, 2014). Instead both peers
were learning through the explanation the one peer would give. If a student can teach
their peers how to solve an equation then they have become proficient in that skill. As a
result the researchers state, “In Chile, we observed that Khan Academy provided the
opportunity for students to do more math through having contact with more math
exercises. The increased interaction with math impacts both students engagement and
learning” (Light & Pierson, 2014). Khan described the technology as it could be used to
teach the entire classroom through the videos, exercises, and data but the teachers knew it
was a technology that could be used as a tool for the students’ success. It was only
brought into the class setting once a week in a computer lab but it was still beneficial for
the students to work at their own pace for understanding. “As the teacher stepped out of
their traditional role, students took on more control of their own learning experiences”
(Light & Pierson, 2014) while the teacher was there to support the students. “The fact
that it does not diverge much from what mathematics teachers already want to be doing
with their students makes its adaptation less intimidating and more feasible” (Light &
Pierson, 2014). The curriculum choices were still made by the math teachers but the use
of Khan Academy could definitely be integrated into the classroom as a tool to motivate
and help students.

Technologies role in education should be just a tool. It can be used to reach new types
of learners that exist today. There are countless resources that are teacher friendly that
already exist teachers just need to make the appropriate adjustments to integrate technology in their classrooms. The curriculum should still be left to the experts of the field, the teachers, but once they decide what they are going to teach technology should find a place in their lesson plans. “Technology offers educators a way to engage students in learning that translates into real-world applications” (Pilgrim, Bledsoe, & Reily, 2012). By making their content relevant, educators are making learning much more appealing to today’s students. Even in debatable the most traditional classroom, mathematics, teachers are still using new advances in technology to help their students achieve success. While some of the new ideas that come with technology are unconventional they will capture the students’ attention and help them discover a better understanding of the skills they need. As educators, the main goal should be student success so the role of technology in education should be a tool to help those students achieve greatness.
References


