Technology in Education

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Abstract

Technology use in education is a growing field as teachers are attempting to maintain the same level of engagement in their classrooms as students experience on a daily basis while using their handheld devices, such as iPads, iPhones, and iPods. Teachers can use technology to monitor student growth, create interactive lessons for students, and communicate with students outside of the classroom. However, with several companies taking advantage of the teachers’ desires to incorporate interactive technology into their classes, it is becoming difficult for teachers to evaluate tools as they are released in order to assess their effectiveness in the classroom (2).

This paper will explore the benefits of using technology in the classroom in order to increase student engagement, encourage collaboration among students, and create an individualized approach to education. Along with the benefits, individual tools will be evaluated in order to assess the usefulness of each tool. The techniques and tools for using the “flipped” model in the classroom will be discussed, as well as the issues faced when attempting to incorporate technology in the classroom. This paper concludes with an analysis of the future of technology use in the classroom by students and teachers.

• Keywords: Technology, education, engagement, assessment
Benefits of Using Technology in the Classroom

Most educators would agree that effective learning includes student higher order thinking where student collaborate to solve real-world problems. Using the technology today, teachers are able to meet the diverse needs of their students and provide them with opportunities that are not found in the traditional textbook. Commercial, off-the-shelf (COTS) games, such as Civilization, “can be a profoundly powerful way for learning about history, and that through game-play players can gained advanced terminology and knowledge of geography, principles of history, and generally increase their interest in this area of study (5).” Lure of the Labyrinth was specifically designed with educational purposes. The primary goal of the game is to enhance “pre-algebra mathematics learning, and a secondary goal of improving literacy(5).” Since no puzzle is ever the same, students must rely on help from their teammates providing a secondary goal of communicating mathematical process. Games like Lure of the Labyrinth can be used as a crucial tool for student engagement while discreetly building their abilities to problem solve and complete math problems.

Even Social Networking has a place in the classroom of today. Sites like MySpace and Facebook “have received intense backlash from schools which are fearful for the online safety of students using these sites, as well as the concern that students will miss use them during what is supposed to be instructional time (5).” There are alternative sites that where teachers can students with opportunities for online communication. Ning is one such site; “Teachers can create their own private social network housed within the NING site. In this way, the teacher can designate who is and is not able to participate in their social network (5).” The use of social networking provides opportunities “to connect students with other students who have similar interests as well as different experiences” allowing students the ability to improve skills in communication, collaboration, and problem solving necessary for the workplace of the future. Edmodo is another popular education site in which students can “post” as if they are on a social networking site and communicate with one another. All of these conversations take place in a closed environment with minimal risk of students sharing too much information with the wrong people. Also, teachers can restrict posts or remove any content that has
been posted by students in attempt to harm or bully another student.

The ability to connect technology to the classroom allows students to take control of their own learning and “can be used to help any student with motivation, academic skills, and social development (8).” The teacher becomes the facilitator of learning rather than the sole holder of knowledge. Since students are able to control their own pace at which they proceed through their exercises, they are neither held back nor left behind by their peers (6). Students are actively engaged and made to think independently when they can control the pace of their learning. The more successful a student becomes, the more self-confidence they gain (6). This attribute is particularly important for students with disabilities. Technology use allows the teacher to differentiate instruction for students. “Children with learning disabilities often have better technology skills than their teachers and are drawn to computers and other gadgets, so using them in the classroom makes perfect sense (8).” Also, in the traditional classroom, students with special needs may be segregated from the rest of the population in order to provide individualized instruction. With technology, all students appear to be working on the same activity. Therefore, students with special needs will not feel left out or singled out for the extra attention because there is no appearance of differentiation. From increased motivation, positive learning environments, and individualized instruction the bottom line is all students can benefit from using technology in the classroom.

**Flipped Classroom**

Salman Kahn, who works with Khan Academy, inspired the idea of a flipped classroom. The definition of a flipped classroom is “students spend time at home watching videos or doing other tutorials instead of doing traditional homework (5).” This quote basically means that students can use technology to do the scaffolding, or building background knowledge, and basic learning before they even receive instruction from the teacher. The class time is replaced by “classroom activities, discussions, and time for students to work in class (5).” This attribute basically means that the teacher can differentiate student learning based on the previous night’s session. The teacher can also delve deeper into the content with the
students, exposing them to higher levels of thinking, such as application, analysis, evaluation and synthesizing information.

There are many benefits to using the flipped class method. Those benefits include: “extra time in class, students can pace themselves, variety of resources used to scaffold learning, extra work time (5).” Many of these aspects would be beneficial to the modern teacher, who has concerns for meeting all students’ needs. Much of the time, it is a time factor that prevents the teacher from giving the student the true differentiation that they need to be successful. This method can help with that because students are doing the basic learning at home.

The concerns with the flipped classroom are: using time wisely, motivating struggling students to work at “home computer access, and support for teachers with technology (5).” Many teachers will at first have concerns about this method of instruction working in their classrooms, most of which revolve around their own ability to teach using the technology effectively. Several of these issues could be handled by simply have professional development around tools to support them. Also, many districts have taken the initiative to purchase technology for students to use throughout the school year to have technological access. Schools are learning how to have students download materials that are found on line before they leave school in order to remove the excuse of lacking Internet access at home.

Web-based Educational Tools Used

Many of today’s students have technology readily available to them, which allows it to be infused in every aspect of their lives. With the movement towards technology integration in our society, many schools are incorporating one-to-one programs in which students have a laptop or tablet provided for instruction. For those schools that do not have a one-to-one program, students are being allowed to bring their own devices in the form of laptops, phones, or tablets. With the introduction of these forms of technology into the classroom, teachers are provided with a tool to not only educate their students but to also show the importance of becoming technologically literate in today’s world. Technology allows teachers to incorporate lessons that are engaging, require critical thinking, and to develop both problem solving and communication skills.
Integrating technology into the classroom is a topic that has an abundance of resources available. Due to the amount of resources, educators are faced with a few challenges. Many are faced with limited time to search for and then determine the appropriateness of various tools for their classrooms. Once the tools are found, they then face the need to learn to use them for proper implementation, which requires more time. To help with this need, Web 2.0 Tools have been developed. These tools are web based, do not require downloads, and they can easily be mastered by both teachers and students alike. Many of the tools are free but offer an option to subscribe to receive additional features. In the article Effective Web 2.0 Tools for Your Classroom, Nicole Wanago says, “Such tools encourage students to interact through collaboration and sharing rather than simply accessing information online (3).” Please refer to Appendix A for more information about tools to integrate technology into the classroom.

Rolling out Technology to Teachers

When rolling out technology to teachers, there are several aspects to consider. These aspects include time, communication, and imbedded professional development. With these three criteria considered, there are several models district leadership teams could follow. One successful model was implemented in the Cambrian School District in California (2).

To ensure teachers were willing to actively study effective technology implementation, the Cambrian School District decided to only roll out iPads to teachers who applied to a special academy. After choosing their top applicants, teachers were required to collaborate with one another using Edmodo, actively study technology implementation, and participate in an end of the year debriefing. Through this process, teachers learned how to use the iPads to enrich student learning around the existing educational standards, and they shared their findings with other teachers who weren’t using iPads, thus becoming “technology evangelists.” After hearing the benefits of classroom iPad use, other teachers became excited about the possibilities of using iPads in their own classrooms and in turn became more willing to apply to the Academy the following year (2).
Best Practices for Technology Use

When using new technology in the classroom, there are several practices teachers should keep in mind. In the Cambria School District, teachers were reminded to use the technology as a differentiation tool in order to ensure individualized education for all students (3). This benefit is perhaps the most important attribute of technology in the classroom. Another aspect for teachers to keep in mind is to not overwhelm themselves by using too many new tools at once. Teachers should focus on using one new tool until it is fully embedded in their classrooms. This technique will cut down on instructional time being used to teach the new tool. As students become experts on that tool, they can help other students use that technology in other classes. Even students who struggle in the academic environment may be “classroom tech experts”, which allows them to experience success in a class they might otherwise have trouble with. Therefore, students will become more motivated by the technology. Teachers should always keep student learning as the focus of the new technology. Otherwise, it will be seen as an “extra” rather than a useful tool.

Issues Facing Technology Use

Time

One issue facing tech use in the classroom is time. When teachers don’t have time to plan effective implementation of a new tool, they either put the tool to the side, thus wasting the valuable resource, or they might try to implement a new tool without testing it first. This practice leads to wasted instructional time as a teacher tries to troubleshoot issues that arise. Another problem caused by the lack of time used to explore technology options is the use of technology that has not been tested. Some districts are quick to jump on the latest tool presented by educational resource companies, but they do not dedicate time to analyze the impact of the tool. Many times, technology rolled out to schools is the Beta version, which means the impacts of the tool have not been studied. This practice leads to teachers unknowingly being the test group for the product they believe will positively impact student achievement, when in reality, no such evidence exists (7). In order to combat this issue, schools must take the time to pilot and study new technology before rolling it out.
across the school or the district. While that time may seem as a waste, it will prevent teachers from using untested technology, and it will hold the technology companies more accountable for the development of the tools.

**Teacher Resistance**

The students of today are vastly different than any group of students in previous years. With the infiltration of technology in their every day lives, students have changed the way they receive information, which in turn changes the way they interact with the world around them. Technology creates a different type of student; therefore, teachers need to become a different type of educator. Along with the needed shift in teaching, classroom expectations and educational standards have also changed which requires technology to become a classroom requirement rather than an indulgence (2).

Resistance to change is an issue that is faced in every facet of society, and education is no different. Teachers may be resistant to implement technology into their classrooms. The resistance can stem from a number of reasons. Teachers may feel uncomfortable using technology in lessons because they do not want to seem that they are not as tech savvy as their students. Some teachers may not feel confident using technology due to lack of professional development leading to self-doubt in how to use programs or how to troubleshoot problems that arise. A final factor that increases teacher resistance is the fact that many do not feel that the academic achievement of students is impacted greatly enough to devote time to learning and integrating technology into their lessons - the need for what technology offers is not truly visible.

In order to combat teacher resistance to technology, schools and districts should not force technology on all teachers at the same time. Instead, organizations should refer to the best practices of rolling out technology. First, allow teachers who are naturally inclined to try new things to work with the new technological tool. When they have positive results with the technology, they will become “technology evangelists” and carry the benefits of the technology to other teachers who are reluctant to use technology. As any other professional, once teachers see positive results from a new tool, they will be more likely to integrate the tool into their classrooms on a daily basis.
**Student Responsibility**

Perhaps the most-repeated reason for not implementing technology in the classroom is student responsibility. With the Internet at their fingertips, students have access to the greatest wealth of information, as well as the dangers of exposing themselves to predators seeking to harm them or steal important information. Just as it is vital for schools to develop well-rounded adults who can actively participate in society, it is also vital to teach students to be good stewards of technology. There are several facets to developing students in this way. The first facet is keeping private information private. With malware ever-lurking on the web, students are constantly being phished for their password information for a variety of websites. While school filters aim to protect students from most threats, many students have unrestricted Internet in their homes. Therefore, to minimize risk to student information, teachers should educate students on the basic rules of Internet security (6).

Another facet to protecting students is teaching them how to avoid predators. Unfortunately, the same tool that can be used to educate students individually can also be used to target children and teenagers. To combat Internet predators, students should be taught the basics of what information can be used to track individuals on the Internet, as well as personal safety basic rules that include never releasing any personal identifying information that could allow students to be located.

The third facet deals more with teaching students to be good stewards of technology. In this day of ever-increasing incidents of cyber-bullying, students need to be made aware of the consequences of their actions. Since the Internet can be viewed as an anonymous environment, students are more likely to engage in bullying they would not participate in face-to-face. Unfortunately, there are several news stories each year that detail a teenager taking his or her life as a result of cyber-bullying. Students must be educated of the fact that their words may have ramifications, and they may be prosecuted in a court of law as a direct result of their actions (6). Just as teachers have a responsibility to protect their students in the classrooms, they also have a responsibility to teach behaviors that will protect their students in a virtual environment.
The Future of Technology Use in Classroom

The goal of using technology in the classroom is to eventually create individualized learning plans for each student and making students more responsible for their own learning. Students will also have access to teachers outside of their school walls through virtual environments as well as video-conferencing. Hopefully, this practice will move students beyond where they would go in the traditional classroom by providing resources they wouldn’t experience in a typical classroom.

Technology integration will also allow teachers to collaborate with other teachers outside of the district boundaries in order to increase teacher knowledge and strengthen practice. Teachers will eventually move from the role of knowledge provider to the role of facilitating student learning and guiding students, providing support to strengthen student weaknesses. Tools are being developed today that will integrate technology into every facet of students’ lives. Why should schools attempt to create a false environment in which technology is seen as the enemy?
Appendix A

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References


Biographies

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