OVERVIEW OF TECHNOLOGY USE IN MIDDLE SCHOOL EDUCATION

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ABSTRACT: *This paper gives an overview of technology use in middle school education. The paper provides a clear understanding of technology integration and educational technology. The paper answers the question of why to use the technology in middle schools. Moreover, it tells about the effective use of technological devices and the best teaching practices when it comes to technology. Finally, with all the advantages technology brings to middle school, the paper also highlights the disadvantages of using technology.*

KEYWORDS: Classroom, Education, Technology

INTRODUCTION

Today, we are using technology in every aspect of our daily lives. The development of technology is increasing every day. "Young people have been and will continue to be born into a digital world where creating, changing, and sharing information with each other" is a regular part of life (Wolfe, 2011). One way we use technology is for education, especially in the classroom. This issue, using technology in the classroom, is not new. According to Wolfe (2011), "by 1990, just before the technology boom, multimedia PCs were being used in many classrooms across the country" but the PCs were for a limited use in the classroom such as Microsoft Office and educational programs. During the past two decades, technology grew and developed. In education, many advantages were seen for teachers. Nowadays, "technology education can have broad appeal and serve many students" (Sherman, Sanders, & Kwon, 2009, p.368). However, "the advent of new technologies is not only changing the face of education, it is redefining the classroom itself" (Wolfe, 2011). By looking to the present events and the development of technology we can see the future of education. Wolfe (2011) asserted that, "the future of technology in education looks bright; the major challenge is keeping up with the speed of change." In fact, there are a lot of reasons to use technology in the middle school classroom. In this research paper, I will focus on the impact of using technology on student engagement and academic achievement in a middle school setting. Using technology tools in the middle school classroom "facilitates student interaction, exchange of ideas, and responsibility-taking as classes are no longer conducted through direct instruction" (Hsieh et al., 2008, p. 37).

Definitions: **Technology, Educational Technology, Achievements, Student Engagement, Blogs and Technology Integration**
Technology has been defined in several different ways according to its use, but in my terms for this action research I will be using "technology" to mean machines and devices made by humans to improve students' skills, facilitate doing activities, and help them to do what they are not able to do. In education, technology is used to facilitate instructional outcomes in order to increase student engagement and academic achievement.

Educational technology, according to Richey (2008), is "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate

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technological processes and resources" (as cited in Wikipedia). More precisely, educational technology encompasses tools used in the classroom to enhance students' engagement and academic achievement. There are two types of educational technology. The first type is hardware such as Desktops, Laptops, Smart Boards, Projectors, DVDs, Pad technologies, Cameras, Video players, Cassette players, and so on. The second type is software such as Internet, websites, Word, PowerPoint, Excel, Paint, etc.

Academic achievement, according to Durham Public Schools (n.d.), is "the level of actual accomplishment or proficiency one has achieved in an academic area, as opposed to one's potential. For example: a student may have the tested potential to read on a 12th grade level, but may only be reading on a 4th grade level." Also, academic achievement is what students have done or achieved academically at schools. It does not include music or sports. However, in this research paper, academic achievement is going to measure the results of students on their MAP tests and course grades to see if their academic achievement has increased after using technology in the classroom.

According to Chapman (2003), student engagement is frequently used to "depict students' willingness to participate in routine school activities, such as attending class,submitting required work, and following teachers' directions in class" (as cited in Wikipedia). Student engagement is the "extent to which all students are motivated and committed to learning, have a sense of belonging and accomplishment, and have relationships with adults, peers, and parents that support learning" (Jones, 2009, p. 24). However, there are many other factors that make students engaged and participate in the classroom. One of these is technology equipment.

Blogs are online journals-a series of archived Internet postings, some of which contain hypertext links to websites and other blogs" (Mullen & Wedwick, 2008, p. 68). In education, teachers can create their own blogs to post any activities, assignments, and lessons for their students. Also, they can post what they have done or want to do in the classroom. Moreover, blogs facilitate students connecting with their teacher and with each other. Technology integration is using computers effectively and efficiently in the general content areas to allow students to learn how to apply computer skills in meaningful ways. However, technology integration not only uses computers, it can be used with the other technology devices such as a Smart Board, projector, DVD, and so on. Technology integration is not providing application software like electronic encyclopedias, spreadsheets, and databases without a purpose (Dockstader, 1999). Technology integration can support and enhance classroom instruction. Also, technology integration can enhance the classroom environment.

Why using technology in the middle school classroom?
As educators, we use technology in the middle school classroom for multiple functions and several advantages. First, using technology creates rich environments where student work shows evidence of conceptual understanding beyond recall. Second, educators use technology for meaningful assessment data that informs their practice allow students to exhibit higher order thinking. Third, using technology encourages students to engage in activities that develop understanding and create personal meaning through reflection. Fourth, educators use and facilitate student use of technology to communicate, collaborate, and create communities with educators, parents, and students. Fifth, using technology provides opportunities for students to apply knowledge in real world contexts. Sixth, using technology provides diverse

and culturally relevant experiences to help students develop an understanding of our world. Seventh, using technology enhances and differentiates instruction in order to present students with a challenging curriculum designed to help each individual student develop a depth of understanding and critical thinking skills. Finally, teachers using technology instruct students more effectively and provide individual experience and empowerment for them (Fisher, 2006).

Effective Use of Equipment

Effective use of technology equipment will improve learning outcomes and twenty-first century skills. As McGehee and Griffith (2004) explained, "Technology does not replace basic understandings and skills. Instead, it is an additional learning tool that fosters deeper understanding" (p. 344). However, there is a lot of equipment that educators can use in the classroom to increase students' engagement and academic achievement. Classrooms should be equipped with a computer, Smart Board, Loudspeakers, DVD player, tape recorder, headphones, digital camera, printer, and wireless Internet access (Lei & Zhao, 2005, p. 4). These tools, however, are nothing without effective use. Teachers need to employ technology tools as much as they can in their lesson plans to keep students engaged and involved. However, this paper willdescribe some equipment, which educators can use in the classroom and I will mention some ideas about how to use it effectively.

The first device that must be provided in the classroom is a computer. What is the computer? Computer is technological device that performs a variety of functions. By inputting some data in the computer, it will store it, process it, and produce it again, which is called output. We can input data by a keyboard and mouse and output data by display on a monitor or a printer. The computer consists of many parts, such as a motherboard, monitor, and modem. With computer use, teachers can improve students' typing skills on the keyboard. Typing is a necessary skill for students because they will need it in college and most workplaces. In addition, by using computers in the classroom, students will learn how to use Microsoft Word, PowerPoint, Excel, and Internet search. During computer instruction time students will learn from their teachers and from each other. Also, when students use computers, they will discover through trial and error how to use it.

The second important device that we should use for the instructional process in the classroom is a Smart Board. Preston and Mowbray (2008) have defined Smart Board as a brand of interactive whiteboard (IWB). Simply speaking, it can be described as a whiteboard displaying the image from the computer monitor with the surface operating as a giant touch screen. The setup can consist of a desk or ceiling mounted data projector and computer or can work on a totally integrated system as is the case for rear projection SMART Boards. The computer can then be controlled from the board itself by touching the SMART Board screen, either directly with your finger or one of the incorporated electronic pens. (p. 50) As we know, the Smart Board must be integrated with computer, digital projector, and sound system. The Smart Board is invalid without these devices. A Smart Board helps teachers and students to do several functions. For example, teachers can write on the interactive board with the electronic pen, drag and drop images or texts, interact in many ways such as touching icons to play videos, save what they have drawn and explained on the board to use in the future, engage with educational multimedia activities, present students' work to the rest of the class, and show video clips to help explain lessons (Preston & Mowbray, 2008, p. 51). However, the Interactive Smart Board with projector will save instruction time and get students

involved, excited, and keep their attention. Also, the needed information is easy to reach. The interactive Smart Board with projector also makes instructions easier and gives teachers a lot of advantages. Some of these advantages are show and tell, step by step instructions, make comparison and contrast, display picture books with reading aloud, and it is easier to explain presentations.

The third and fourth devices that should be provided together in the classroom are a tape recorder and headphones. To increase student engagement and academic achievement in reading, students can read some passages in the classroom and record themselves to measure their reading skills. When they listen to their recording, they will make corrections and avoid their mistakes. Using a tape recorder and headphones can help to improve students' reading skills (Smith, 2007, p. 32).

The fifth device that can be used in the classroom is a digital camera. The old kind of cameras are difficult to use in the classroom because they need film to record pictures or videos and it takes a long time to transfer the pictures or videos to the computers, but with the digital camera the students and educators do not need film anymore because they can store a huge number of pictures and videos in a small digital memory. In addition, when they take pictures or videos, they immediately can download them and make editing with a graphic and filmmaker program. In the middle school classroom, teachers and students can use the digital camera to capture images of the elements of art. Also, they can make some projects or movies by using moviemaker or any video editing software (Smith, 2007, p. 32).The sixth device that should be provided in the classroom is a DVD or CD player. Using DVD and CD players in the classroom will improve students' listening to the story read aloud and students' comprehension.

RESEARCH FINDING

Some studies suggest that reformation of technology in the classroom is of best interests to educators. According to Russell (2006), billions of dollars are allocated to the educational technologies such as, computer hardware, software and teacher training on a yearly basis. And the proper usages of these technologies lead to student engagement and student achievement. Furthermore, Russell (2006) contends, "It would appear from this research that teachers who utilize technology in a constructivists environment are more successful in improving student achievement" (p27). Here, valid research shows that an integration of technology in the classrooms is difficult, yet more conducive to the students learning experience. Russell (2006) asserts, The journey to a fully integrated approach is not an easy one, as many teachers have found that "integrating technology into the education systems and using it in ways that increase student learning and achievement are far more complex tasks than expected" (p42). A quality education for a student who needs to be engaged and wishes to be successful is never an easy task and will require much effort on the teachers leading the way through integration. Technology integration in the classroom clearly allows for student engagement and an increase in academic achievement. As long as the reformation of educational technology is lead by individuals who are trained and know how to reintegrate technology into the classroom. A series of studies conducted by Russell (2006) indicate, "Certain pedagogical (learner-center and project based teachings) may result in higher academic achievement"(p159). All of Russell's findings show that technology in the classroom

contributes significantly to student success, but the teacher must have the proper knowledge to enable him or her to integrate the technology in the classroom.

Effective Teaching practices

Integrating technology in the middle school classroom is an effective teaching practice. "Integration is not putting computers in the classroom without teacher training. It will not happen without training" (Dockstader, 1999). Because of that, teachers must be trained how to properly integrate these powerful instructional tools. In fact, you can lead a horse to water but you can't make him drink. Clearly, when classroom use integrated technological equipment it does not mean students will engage and achieve unless teachers use this equipment effectively. However, there are numerous ideas that can help teachers to use technology in the classroom effectively to achieve the purpose of teaching. Indeed, technology tools in the classroom help teachers to do what they want to do. Also, "When technology is used with effective instruction practice, it will facilitate learning so that students learn the content area to a deeper level and develop 21st Century Literacy skills in the same time" (Fisher, 2006). The problem with some teachers is that they are afraid of using something new. However, teachers have to get over their fears and try to find any tools that are interesting to the students that will help to improve student achievement (Takahashi, 2011). Proper integration of technology practices will make the best teachers even better as they reach, engage, and teach our 21st century students.

Students

Since 1992, many researchers have been interested to look for ways that could help to increase student achievement (Hsieh, Cho, Liu, & Schallert, 2008, p. 34). One of the researchers is Wolfe (2011) who found that students learned best when they use technology. Wolfe (2011) showed from his study that 69% of students agree that technology helped them to learn more, while 31% of the students disagree with that. The study showed that students who use technology in the classroom have improved their skills. As a result, students should engage with technology because of the world they live in (Mullen & Wedwick, 2008, p. 66). Today, most of the students between ages 7-17 use computers at home to do their assignments (Lazarus et al., 2005, p. 22). These days, the number of students who have access to the Internet has increased 1,100 percent over the past decade. The study shows that more than 25 million children are now using technology whether at home or at school (Patterson, 2005, p. 68).

Online Resources

There are many online resources that can help in the educational progress. Some of these resources are made for educational purposes and a lot of resources can be used in education. One of these famous resources is YouTube. It is a video-sharing website founded in 2005. It has billions of videos on different subjects and millions of people visit YouTube.com daily. However, YouTube has a lot of educational videos that can help teachers to support and to enhance almost any classroom lesson (Mullen & Wedwick, 2008, p. 67). Using YouTube.com, teachers can create an account on YouTube to save their favorite videos which they can share with their students. "Many teachers are creating instructional videos and placing them on Internet websites such as YouTube" (Wolfe, 2011). According to Mullen and Wedwick (2008), "teachers and researchers are just beginning to discover its' [sic] potential in an educational setting" (p. 67).

In addition to the YouTube, there are other video-sharing websites that can support and enhance teachers' lessons such as "TeacherTube, Schooltube, United Streaming, OneworldTV, Yahoo! Video, Google Video, and MSN Soapbox" (Mullen & Wedwick, 2008, p. 67). However, there are a lot of online resources that could help teachers to integrate technology into the classroom such as Facebook, Twitter, web quests, Moodle, Internet searches, websites, educational websites, online libraries, and academic achievement games. Those resources are helping the teacher to create activities for their mstudents and make the lesson fun to them.

Disadvantages of a Technology Classroom
Even if there are a lot of advantages of using technology in the classroom, there are
also disadvantages such as exploration, cost, training, level of skills of teacher, students knowing more than teacher, internet safety, and keeping students safe (Hermitt, n.d.). The first disadvantage of using technology in the classroom is exploration. When students browse the Internet to find specific information, they may explore beyond the bounds and become distracted by other activities that they find on the Internet. The second disadvantage of integrating technology into the classroom is the cost of it. Technology in general is expensive. Schools with minimal technology resources can spend hundreds of thousands of dollars a year. In addition, when the schools provide a laptop for each student to use in the classroom, the school must replace them every two to three years and this is going to cost them a lot of money. The third disadvantage of using technology in the classroom is training the teachers and students. If the schools want to integrate technology into the classroom, they have to train teachers and students and this will be costly and time-consuming. Moreover, most of the teachers are unwilling to participate in the extra training. The last disadvantage of integrating technology into the classroom is the difficulty for the teacher because it is not easy to find the right materials online to integrate into a lesson. This means teachers may spend a lot more time planning lessons and become overwhelmed and frustrated (Hermitt, n.d.).

CONCLUSION

In conclusion, when we are looking to all of these technology features in education we hope that schools do their best to integrate technology in the middle schools classroom. Researchers found out that integrating technology into the classroom is a way to facilitate the curriculum. In addition, according to Hsieh et al., (2008), "technology creates a way to bring authentic problems into the classroom, so technology is viewed as an integral part of teaching and learning to improve both the effectiveness of instructional strategies and student motivation" (p. 37). When teachers use technology, they can address the different learning styles of their students. Many children who do not do well in paper/pencil activities can do well when they are allowed to use technology. Students are often engaged by technology (Smith, 2007, p. 32). Technology is the way of 21st century teaching to reach and engage the largest number of students in the most affordable way.

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