

EDUCATIONAL TECHNOLOGY AND ITS EFFECTIVE USE

By

RHONDA PUCKETT

Liberty University

ABSTRACT

Technology is becoming more and more prevalent in the American classroom. Students are becoming extremely knowledgeable of computer programs, iPads, and their applications are in an increasing manner. The reasoning behind the push for such technology in the classroom is for students to become accomplished twenty-first century learners, college- or career-ready upon graduation. The motivation of this research is to determine the effectiveness of technology in the classroom. Questions used in this inquiry include: What subject areas can technology successfully be integrated into; is technology an effective source of individualized instruction to create a successful learning atmosphere; and what types of technology are most effective in educational settings? Concluding evidence determined that technology can be highly effective with various forms of implementation in classrooms ranging from kindergarten to twelfth grades. Further research would be helpful in the various ways that technology can be implemented more successfully for individualized instruction and whether particular types of technologies are superior to others.

Keywords: Technology, Technology in the Classroom, One-to-one Technology, Educational Technology.

INTRODUCTION

Technology in today's classrooms is becoming increasingly prevalent. In several states, technology integration has become part of the curriculum; more than simply an enrichment class to be taken once a week, but part of the learning experience in each core subject. More and more classes are gaining access to document cameras, interactive whiteboards, tablets, laptops, and various other methods of technology to enhance the learning process. The question is: Does technology integration help and, if so, how? This paper studies the true efficiency of educational technology in order to understand whether its implementation is justly preparing students for the twenty-first century, better training them for college or careers.

What Research Shows About Technology

In research completed by Cheung and Slavin (2013), technology integration in the classroom is an important component for student success in mathematics. Through their work, Cheung and Slavin (2013) determine that moderate implementation is more effective than low or high intensity integration. Elementary students appear to have a greater outcome with multimedia applications

than students in upper grades; however, there was not a significant difference between the two areas (Cheung & Slavin, 2013). Cheung and Slavin's (2013) determinations are based on student scores on pre-assessments compared to student scores on post-assessments, finding that technology implementation has a positive effect on the learning outcomes for students.

Blachowicz, Bates, Berne, Bridgman, Chaney, and Perney (2009) declare that the use of multimedia activities in the classroom are effective in literacy achievement in schools with lower socioeconomic status. Teachers in the study state that they are able to get farther with their instruction in less time because of the success with technology implementation (Blachowicz et al., 2009). Because the multimedia activities are engaging, students are excited about completing them, keeping them motivated while they are successfully learning (Blachowicz et al., 2009). The technology program allows for differentiated instruction in literacy, which will lead to greater success for students with continued use (Blachowicz et al., 2009). Morgan (2010) notes that the use of multimedia in literacy is able to improve vocabulary by instantly affording students with a definition and illustration of various terminology.

Lacina (2008) concurred with this summation after observing the use of iPods in ELL classrooms (as cited by Morgan, 2010). As students were engaged, the English Language Learners' scores improved through the use of electronic books, commonly referred to as "eBooks", as the visual opportunity of understanding vocabulary and seeing an example of it made comprehension of the terms more feasible (Morgan, 2010).

How can one determine the effectiveness of technology implementation? Jenkinson (2009) points out that measuring cognitive load determines whether or not a particular technological implementation is profitable for students. Based on Jenkinson's (2009) research, the integration of "multimodal" technology has the ability to support student learning in a positive way because it promotes inquiry (p. 278).

Because research has determined technology can play a vital role in the educational realm, one must understand why it plays such a pertinent part in the learning community. Following, the reader will be able to determine that multimedia activities are responsible for creating an engaging, inquiry-based environment that can reduce behavior problems and promote student participation, cognitive ability, problem solving skills, collaboration, and authentic assessment.

Student Participation

Courts and Tucker (2012) assert that technology may not necessarily have a direct impact on the academic success of students. They did find, however, that the implementation of multimedia activities did, in fact, improve student engagement in the learning process due to the ability to reach various learning styles (Courts & Tucker, 2012). As students' learning styles are addressed, they become more engaged in learning, and their success rates will rise. Therefore, if technology plays a part in student participation, it has a positive, yet indirect, impact on the success of students (Courts & Tucker, 2012). Bang and Luft (2013) agree with the assertion that technology is able to address various learning styles in order to maintain student interest through the use of "meaningful contexts" (p. 119).

Courts and Tucker (2012) also emphasize that the incorporation of video technology through the use of

television-based videos, internet-streamed videos, or video conferencing is a significant way to reach visual learners. The writers declare that the use of video technology afforded Chicago students the opportunity to comprehend difficult concepts better, improving assessment outcomes (Courts & Tucker, 2012). Implementing digital video technology, according to Lim, Pellett, and Pellet (2009), is an essential opportunity to create engaging learning scenarios for students that promote critical thinking and creativity. They also recognize the need for students to be hands-on learners instead of simply participating as bystanders (Lim et al., 2009). The implementation of digital video technology encourages students to be actively engaged, putting on display what they have learned over the course of a given unit (Lim et al., 2009).

Lavin, Korte, and Davies (2011) assert that technology integration is "one way instructors can maintain student interest" (p. 5). The authors note that multimedia integration can have a positive effect on preparation, how well a student pays attention, the notes taken for the class, and participation of the student. Lavin et al. (2011) note that with the positive effects the implementation of technology has on student success, it also has a positive effect on student behavior. As student behavior improves, there are fewer class disruptions, which take away from the learning process in the educational atmosphere. With fewer class disruptions, the teacher is able to cover more material, which, in turn, improves student success. Therefore, according to Lavin et al. (2011), technology integration is an important integration in the classroom.

The use of the game system named Nintendo Wii in PE has an attraction that draws students into participation like never before, according to Maldonado (2010). The games are interactive and competitive, but yet they accomplish getting students up and moving, increasing their heart rates, which leads to better heart health (Maldonado, 2010). Students are actively engaged and learn the importance of physical fitness through games such as *Wii Sports* and *Mario and Sonic at the Olympic Games* (Maldonado, 2010).

Cognitive Ability

Maldonado (2010) suggests that the use of a Nintendo Wii

game system could prove to be an elemental opportunity for cognitive development. Games such as *Big Brain Academy* challenge students to various math and higher order thinking skills (Maldonado, 2010). Once a particular set of skills have been mastered, the game increases the difficulty level in order to continue building the cognitive development of the use (Maldonado, 2010). Pilgrim, Bledsoe, and Reily (2012) state that many educational applications such as iPads, tablets offer individualized instruction and immediate feedback to increase a student's learning.

Problem-Solving Skills

Implementing digital video technology, according to Lim, Pellett, and Pellet (2009), is a fundamental opportunity to create engaging learning scenarios for students that promote critical thinking and creativity. Students are responsible for determining what information to include and exclude from their project and then conclude which measures to employ in order to produce their project (Lim et al., 2009).

Collaboration

Pilgrim et al. (2012) define collaboration as building a partnership among peers in order to gain knowledge of a subject area. The use of online technology affords students the ability to collaborate with their peers through various efforts (Pilgrim et al., 2012). Through the use of *Googledocs* (powered by Google, docs.google.com) and wiki platforms, students who would not typically be comfortable in sharing in the traditional setting are able to share equally with their peers (Pilgrim et al., 2012).

According to Courts and Tucker (2012), the use of audio technology, such as telephony services (Voice-over Internet Protocol, commonly referred to as VoIP) allow students to participate in Skype activities (Courts & Tucker, 2012). The integration of VoIP allows students to "interact with guest speakers and experts around the globe", gaining access to information not normally available (Courts & Tucker, 2012, p. 123). Also by implementing VoIP into the classroom, students gain expertise in using the Internet-based program and can collaborate with peers on cooperative assignments or contact their teachers for questions regarding homework (Courts & Tucker, 2012).

Bang and Luft (2013) assert that the implementation of technology in the science classroom increases the collaboration of students through project-based learning. Students must work together to use various forms of technology in order to gain further understanding of scientific concepts. Bang and Luft (2013) note that the collaborative use of multimedia devices uphold the engagement of student interest, therefore creating academic gains.

Authentic Assessment

Day (2012) declares that the use of WebQuests are vital in the promotion of "critical thinking, cooperative learning, [and] authentic assessment" (p. 107). WebQuests are successful in academic achievement because students are not simply regurgitating information (Day, 2012). Instead, they are responsible for actively searching for information based on the structure provided by the teacher, building critical thinking and cooperative learning (Day, 2012). WebQuests are designed so that students remain engaged and successful with the assignment (Day, 2012).

Student blogging, as reported by Courts and Tucker (2012) encourages students to reflect on what they are learning and then report their considerations on the class blog. The use of a class blog will encourage interaction among peers, in that while all students must reflect internally and then post their contemplations, they must respond to their peers' input as well. Doing so is indicative of higher order thinking skills, creating a more successful, rigorous learning atmosphere (Courts & Tucker, 2012).

Discussion

Jenkinson (2009) noted inconsistencies of how effective technology implementation truly is. Discrepancies can be noted due to how information is gathered and due to various limitations. While there is plenty of evidence that points in favor of technology implementation, there are several facts that can hinder its effectiveness.

Limitations

There are numerous limitations that could affect the effectiveness of multimedia implementation. These limitations may be in result to availability; teacher usage,

training, perception, preparation; and student perception. Following, the details of each limitation will be further described.

Funding

Clarke and Zagarell (2012) assert that funding is a major setback for the implementation of technology. Each year, additional funds are reallocated from education to other areas of the budget, causing administrators to use their schools' funds in other ways other than technology. The most current technology is not affordable to those schools which, in turn, presents a disservice to educators because students are unable to use the most up-to-date form of technology available (Clarke & Zagarell, 2012). Along those lines, administrators are also incapable of funding appropriate training for their staff on how to effectively implement technology in their classrooms (Clarke & Zagarell, 2012). Courts and Tucker (2012) concur with the fact that technological devices are expensive; however, they believe that as devices become more prevalent in society, the cost will begin to decrease. This will create better opportunities for their implementation.

Teacher Usage

Courts and Tucker (2012) report that it is imperative for educators to facilitate the use of multimedia activities. As more technological opportunities become available, teachers will have ample opportunities for its implementation; however, unless educators make time for its incorporation, true effective integration will not happen. The multimedia endeavors must be compliant to the unit of study, otherwise the efforts are in vain (Courts & Tucker, 2012). Alsafran and Brown (2012) noted assert that how the teacher uses particular technological devices within the classroom is equally important. Teachers in the United States have not been as successful as educators in Singapore in technology integration according to the research of Alsafran and Brown (2012).

Teacher Training

Lim et al. (2009) discussed how important the use of digital video technology can be. However, in order for it to be effective in the classroom, the teachers must be properly trained in how to create a digital video; which materials to use and how to use them. Jenkinson (2009) also discussed

the need for proper teacher training, stating that teachers often try to implement technology into the classroom without fully grasping the how it works or in which context it should be used. This, unfortunately, does not effectively integrate multimedia learning into the academic environment. In fact, it renders it useless (Jenkinson, 2009).

Teacher Perceptions

Chen, Looi, and Chen (2009) state that an educator's knowledge plays a vital role in how decisions are made within the classroom. With many teachers being apprehensive regarding the integration of technology, many are opting not to implement it (Chen et al., 2009). Blachowicz et al. (2009) note that educators who are uncomfortable about implementing a new program relay their uneasiness to their students, which will cause them to be anxious about its implementation. Clarke and Zagarell (2012) also note that many educators are, simply, resistant to the integration of technology into their classrooms, noting that this opposition "seems not to be a barrier itself; instead it is an indication that something is wrong" (Bingimlas, 2009, p. 238, as cited by Clarke & Zagarell, 2012, p. 137). One of these problems, noted by Clarke and Zagarell (2012) is that some teachers are apprehensive, and therefore unenthusiastic about implementing technology because they have not had the same exposure to its use as many of their colleagues. Mitchell (2011) concurs with this assertion, stating that educators who are uncomfortable with the use of technology "think they will not use or do not need to use" it (p. 49). Bang and Luft (2013) agree with the summation that many educators who are not native to the use of technology are not as willing to implement its use into the classroom.

Teacher Preparation

Day (2012) discusses the importance of teacher preparation when integrating technology. Effective multimedia implementation cannot take place without proper preparation (Day, 2012). Mitchell (2011) asserts that most educators who are unsuccessful with the implementation of technology into their classrooms are not profitable due to the fact that the integration of multimedia activities involves strategic planning. Day (2012) reviews the expectation of teacher preparation for creating and

carrying out a WebQuest activity with a group of learners. It is no small feat and not an activity that a teacher can implement, simply, because (s)he feels like it. WebQuest activities require planning and preparation, behind the scenes work, before it can be presented to students effectively, much like most multimedia implementations (Day, 2012).

Conclusions and Future Study

In order to obtain an understanding of the effect technology implementation has in the classroom, it is essential to complete the necessary research that assesses each aspect of technology integration. In completing the research of the effectiveness of technology in classrooms, the impact signifies success. While there are various forms of effective multimedia tools that may be implemented in a learning community, it is essential to be sure the various forms are available, the educator is efficiently trained with using the tool(s), and that the teacher is prepared to use the particular tool(s). If each pertinent step is meticulously followed, the educator can reap the benefits of technology integration.

References

- [1]. Alsafran, E., & Brown, D. S. (2012). The relationship between classroom computer technology and students' academic achievement. *Research in Higher Education Journal*, 15, 1-19. Retrieved from <http://search.proquest.com/docview/993151562?accountid=12085>
- [2]. Bang, E., & Luff, J. A. (2013). Secondary science teachers' use of technology in the classroom during their first 5 years. *Journal of Digital Learning in Teacher Education*, 29(4), 118-126.
- [3]. Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of literature. *Eurasia Journal of Mathematics, Science and Technology Education*, 5(3), 235-245.
- [4]. Blachowicz, C. Z., Bates, A., Berne, J., Bridgman, T., Chaney, J., & Perney, J. (2009). Technology and at-risk young readers and their classrooms. *Reading Psychology*, 30(5), 387-411. doi:10.1080/02702710902733576
- [5]. Chen, F. H., Looi, C. K., & Chen, W. W. (2009). Integrating technology in the classroom: A visual conceptualization of teachers' knowledge, goals, and beliefs. *Journal of Computer Assisted Learning*, 25(5), 470-488. doi:10.1111/j.1365-2729.00323.x
- [6]. Cheung, A. C. K., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in k-12 classrooms: A meta-analysis. *Educational Research Review*, 9, 88-113. doi: <http://dx.doi.org/10.1016/j.edurev.2013.01.001>
- [7]. Clarke, G., & Zagarelle, J. (2012). Teachers and technology: A technological divide. *Childhood Education*, 88(2), 136-139.
- [8]. Courts, B., & Tucker, J. (2012). Using technology to create a dynamic classroom experience. *Journal of College Teaching & Learning*, 9(2), 121-127.
- [9]. Day, B. (2012). WebQuests for the classroom. *Social Studies Review*, 51, 107.
- [10]. Jenkinson, J. (2009). Measuring the effectiveness of educational technology: What are we attempting to measure? *Electronic Journal of e-Learning*, 7(3), 273-280.
- [11]. Lacina, J. (2008). Learning English with iPods. *Childhood Education*, 84, 247-249.
- [12]. Lavin, A. M., Korte, L., & Davies, T. L. (2011). The impact of classroom technology on student behavior. *Journal of Technology Research*, 2, 1-13. Retrieved from <http://search.proquest.com/docview/887909067?accountid=12085>.
- [13]. Lim, J., Pellett, H. H., & Pellett, T. (2009). Integrating digital video technology in the classroom. *Journal of Physical Education, Recreation & Dance*, 80(6), 40-45,55. Retrieved from <http://search.proquest.com/docview/215753882?accountid=12085>.
- [14]. Maldonado, N. (2010). An innovative learning tool in the classroom. *Childhood Education*, 86(4), 284-285. Retrieved from <http://search.proquest.com/docview/670347577?accountid=12085>.
- [15]. Mitchell, R. L. (2011). Planning for instructional technology in the classroom. *New Directions for Community Colleges*, 2011(154), 45-52.
- [16]. Morgan, H. (2010). Using handheld wireless technologies in school: Advantageous or disadvantageous? *Childhood Education*, 87(2), 139-142.

ARTICLES

[17]. Pilgrim, J., Bledsoe, C., & Reily, S. (2012). New technologies in the classroom. *Delta Kappa Gamma Bulletin*, 78(4), 16-22. Retrieved from <http://search.proquest.com/docview/1030259924?accountid=12085>.

ABOUT THE AUTHOR

Rhonda Puckett is currently a National Board Certified first grade teacher in Greensboro, North Carolina, in the United States. She is presently a student at Liberty University, earning a Master of Education degree in Leadership, Teaching and Learning cognate. Professionally, Ms. Puckett enjoys networking, inquiry-based and project-based learning, and integrating technology into the classroom. Personally, she appreciates traveling with her family.

