Research Proposal:

Effects of Classroom Technology on Learning: Can Tablet Technology Increase Learner Achievement?

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Abstract

The proposed study is designed to determine if the use of classroom technology affects learner attention and classroom achievement. The focus of this study is to explore the use of tablet technology in the classroom and the effects it has on student learning. Participants will be 100 general education students randomly selected from the seventh grade. Participating students will be given a pre-test before the first official class, and a post-test at the end of the semester. Higher levels of learning are expected to be associated with tablet learning. The proposed research will provide insight into the potential benefits of tablet technology in the classroom environment.

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Effects of Classroom Technology on Learning: Can Tablet Technology Increase Learner Achievement?

The proposed study is designed to determine if the use of classroom technology affects learner achievement. In particular, this study explores the use of tablet technology in the classroom and the effects it has on student learning. In the growing digital age of America, technology has integrated itself into all aspects of life. Not only has technology increased in school classrooms, but it has also been slowly integrated into educational curriculum (Puckett, 2013). Access to computers and other devices is nearly universal in America (Blackwell et al., 2013). Consequently, the educational system has made significant investments in the implementation of technology in the classroom since the early 1980s (Stevenson, 2013). As a result, almost 95% of American students use a computer daily, 70% using it for school-related purposes (Mostmans et al., 2012). However, questions of the effectiveness of technology for learning have aroused with its growing use. On one hand, it has been a popular view that young children should be limited to their use of technology because screen time hinders development; therefore technology use in schools should be limited (Blackwell et al., 2013). On the other hand, another popular view posits that children are “digital natives” and should prepare in school for the technological lifestyle of the modern world (Mostmans et al., 2012). Both of these ideas about technology use in the classroom are influencing the diverse ways individual teachers integrate it into their teaching. The following will review what current research shows about using technology as an effective tool for learning in the American classroom.

In a study of the integration of Interactive White Boards in a summer course, college students reported that they had an increase in interest, motivation, and concentration in comparison to traditional instruction (Cutrim Schmid, 2008). The interactive aspects of these types of technology have been shown to support, enrich, and motive student learning through the intrinsic motivation students have to simply use technology; the motivation allows for cognition to become the focus (Offer & Bos, 2009). Motivated students can then be creative, competitive, and have fun all while thinking critically and solving problems (Puckett, 2013). Physical and aesthetic characteristics of the classroom can enhance the children’s attitudes towards learning (Asiyai, 2014). In a case study of technology-based classrooms in a secondary school, students excitedly reported how much they enjoyed using technology as part of their classroom environment. Researchers noted that these students became more engaged with the material and each other in these technology rich classrooms (Offer & Bos, 2009). Thus, the use of technology, as a supplemental tool during instruction powerfully motivates students and consequently increases their engagement.

Student engagement has proven to increase with the use of technology. In a college classroom environment with a 1 to 1 ratio of students to computers, researchers found that when technology supported independent student learning, it also increased social and cognitive engagement with the material (Gebre et al., 2014). Due to this individual engagement with material, students are less likely to simply regurgitate information. Instead they have to search for meaning in context and collaborate with peers (Puckett, 2013). This student-centered approach to teaching has been proven effective. Offer & Bos (2009) found that in a technology-based math classroom, students were able to guide themselves through material and go at their own pace. This system provides more access to extra resources and information as well (Cutrim Schmid, 2008); therefore students are able to creatively engage themselves in the material. Lastly, when elementary age students are actively engaged with technology, time on task increases by an average of 20% (Getting & Swainey, 2012).

In 2012, tablets were used among undergraduate engineering students as a way to help facilitate learning. The use of the tablet technology, in the engineering class, was studied to determine if there was any link between student learning behavior and tablet use. The technology allowed for students to draw on their tablet and include any visuals they might need. The tablets also made note taking and sharing much easier. The ease of use promised more student motivation to learn. The results of the study revealed that the students using the tablets more frequently were more engaged in their courses. In this particular study, it seems that tablet technology was beneficial to student learning and achievement (Amelink, 2012).

The most difficult part of implementing tablets into a classroom is understanding how the integration will work with students and teachers. It is important to have a good plan when deciding to integrate tablets into the classroom, and it is important to know how they will affect the learning environment. A study conducted in 2010 appeared in the journal of College Teaching specifically focuses on tablet PCs in the classroom and the Interactive Learning Network (ILN) designed to improve student participation while giving immediate assessments of learning. In the ILN model, real-time feedback is provided in order to maximize learning. Using this model, the classroom environment is created using the tablets and a software application called NetSupport School. The software is what ties the teachers and students together with the tablets by providing teachers with a way to monitor student progress in real-time. With the software, students can also ask questions without the class knowing, and receive visual aid in a matter of moments. It is worth noting that the tablets are much more helpful to the learning environment when paired with software of this type. The study conducted, monitored the progress of students that used the ILN model and those that did not use the model. Identical homework problems and final examinations were given to all students that participated. The results of the study showed that the groups using the ILN model were more successful in their completion of homework due to solving problems with the instructor’s help in class. It is likely that students did better in the ILN classes because they knew that the instructor was monitoring their progress. Teachers were also able to identify common learning problems relatively early in the process. Students taking part in the ILN were more engaged shown by their higher attendance rates. The ILN students also spent more time studying. The study showed a statistically significant improvement in ILN class performance than traditional classes (Enriquez, 2010).

When implementing technology into classrooms, teachers often question the ideal conditions for learning and how technology aids these conditions (Cutrim Schmid, 2008). According to Gebre et al., learning occurs best under conditions that support student-teacher contact, student-student collaboration, active learning, immediate feedback, clear expectations, and flexibility for individual learners; according to (2008). Technology can be used to support all of these. It is important to note that although technology use is beneficial in these areas, it should not dominate instruction because integrating technology in moderation has been proven most effective (Puckett, 2013). Therefore with the addition of technological tools, studies have shown that children are more motivated, engaged, and individualized during instruction.

In order to completely discuss the implementation of technology in the classroom, drawbacks must be noted as well. These include overuse of technology and negative teacher perceptions. As mentioned already, moderate use of technology is more beneficial than high usage (Cutrim Schmid, 2008). When technology aids moving through instruction quicker, students can become overwhelmed; students need time to interact with material and understand the tools they are using in order to effectively learn (Stevenson, 2013).

The focus of the proposed study is on effects of tablet use in the classroom on learner achievement. The hypothesis is that classroom tablet use will lead to higher levels of student achievement when compared with traditional modes of learning.

Method

*Sample*

The sample of participants consist of 100 general education students from a local middle school. Participants will be randomly selected from the 7th grade student population. Informed consent will be obtained from parents for all participants. Each participant will sign an assent form.

*Materials*

The materials needed are the 7th grade Benchmark Test (NCSS) as a reading pre-test and the 7th grade Benchmark Test (NCSS) as a reading post-test. This test is used to determine the reading proficiency of students at the seventh grade level. The test is 26 pages long and will be made up of five short stories and three poems. There will be a series of 5-6 multiple choice questions that students will be asked to answer after reading each individual story or poem. We will also use 50 iPads in the experimental group.

*Procedure*

The participants will be randomly assigned into the experimental or control group. There will be 50 students in each group. The experimental group will be learning through the use of iPads. There will be one iPad for each student. The control group will be learning through traditional methods of learning such as books, pens, and paper. We will use video feed of a seventh grade reading instructor to lead each group to provide more control. An initial pre-test for 7th grade literacy will be given to each participant to assess his or her prerequisite knowledge. The groups will meet in separate classrooms every Tuesday and Thursday, after lunch, for the entire North Carolina public school year. The group sessions will last forty-five minutes, except on the first and last day when each group takes the pre and post-tests. During the forty-five minute classes, participants will be taught material from the North Carolina Common Core Standards for 7th grade literacy. In each session, the groups will be required to read a short story, poem, or both depending on the length of the works. The students will then be asked to answer a series of multiple-choice questions regarding what they have read. These questions will be used to gauge student’s reading comprehension and understanding. The experimental group will read the same exact material and answer the same multiple-choice questions for each reading assignment as the control group during the group sessions. The only difference between groups will be the method of learning. The experimental group will be reading and answering questions on the iPad while the control group will read from textbooks and answer questions using a pen on a piece of paper. At the end of the semester, all participants will be given a 7th grade literacy post-test to assess any changes in comparison to the pre-test.

Results: Proposed Data Analysis

We will average the changes between pre and post-test scores for the control group and the experimental group. The independent variable is iPad use, and the dependent variable will be the average change in test scores for the control and experimental groups. We will use the mean to measure the averages of all observed test scores. We will use independent groups T-test to compare the sample means. Our hypothesis is that iPad use in the classroom will be associated with higher growth in literacy scores when compared to traditional methods of classroom learning.

Discussion

The proposed project studies the effects of technology on learner achievement in a classroom setting. Access to computers and technology is nearly universal in America and consequently is becoming more common in educational settings. Therefore the purpose of the proposed project is to determine whether this increasing use of technology is beneficial for learning. Our hypothesis is that use of technology for learning, by use of iPads, will increase learner achievement. If results were to support our hypothesis, it would be reasonable to imply that increasing technology use in schools would be beneficial to student learning over time.

The proposed research will afford an understanding of how tablet technology can be used and implemented in the school system to increase student learning and achievement. To account for variances in age, future research should include students at different age levels in order to generalize results. Future research on this topic should also take into consideration the different types of technology that students can use for learning, and the extent to which that technology is used in and out of the classroom.

References

Amelink, C., Scales, G., & Tront, J. G. (2012). Student use of the tablet PC: Impact on student learning behaviors. Advances In Engineering Education, 3(1), 1-17.

Asiyai, R. (2014). Students’ perception of the condition of their classroom physical learning environment and its impact on their learning and motivation. College Student Journal, 48(4), 716-726

Blackwell, C., Lauricella, A., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. Computers & Education, 69, 310-319. doi:10.1016/j.compedu.2013.07.024

Cutrim Schmid, E. (2008). Potential pedagogical benefits and drawbacks of multimedia use in the english language classroom equipped with interactive whiteboard technology. Computers & Education, 51, 1553-1568.

Enriquez, A. e. (2010). Enhancing Student Performance Using Tablet Computers. College Teaching, 58(3), 77-84.

Gebre, E., Saroyan, A., & Bracewell, R. (2014). Students' engagement in technology rich classrooms and its relationship to professors' conceptions of effective teaching. British Journal Of Educational Technology, 45, 83-96. doi:10.1111/bjet.12001

Getting, S., & Swainey, K. (2012). First graders with iPads?. Learning & Leading With Technology, 40, 24-27.

Mostmans, L., Vleugels, B, & Bannier, S. (2012). Raise your hands or hands-on? The role of computer-supported collaborative learning in stimulating intercreativity in education. Journal Of Educational Technology & Society, 15, 104-113.

Offer, J., & Bos, B. (2009). The design and application of technology-based courses in the mathematics classroom. Computers & Education, 53, 1133-1137.

Puckett, R. (2013). Educational technology and its effective use. Journal Of Educational Technology, 10, 6-11.

Stevenson, I. (2013). Does technology have an impact on learning? A fuzzy set analysis of historical data on the role of digital repertoires in shaping the outcomes of classroom pedagogy. Computers & Education, 69, 148-158.