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1:1 iPads and Student Achievement

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1:1 iPads and Student Achievement

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Abstract

Technology in education is continuously changing and having various effects on both teaching and students' academics. It is essential to understand how both teachers and students are impacted by technology and to learn what research suggests. The topic explored throughout this paper is how professional educators utilize 1:1 iPads in elementary school positively impact students' academic achievement. In order to examine existing research on this topic, it was important to utilize both quantitative and qualitative research which helped to identify various factors about how the use of 1:1 iPads in the elementary classroom can have positive effects on students' academic achievement. The literature showed the use of iPads and technology in the classroom had positive effects on academic achievement, especially in the short-term. The long-term effects of iPads and academic achievement appeared to be inconclusive. However, through the use of proper iPad and technology integration, student engagement, and using game-based learning, the use of iPads helped to create a positive learning environment that promoted success.

Key Words: iPads, differentiated instruction, integration

1:1 iPads and Student Achievement

Chapter One: Introduction

Education has changed throughout the past few decades through the use of various forms of technology that are accessible to students. Technology has a way of making things easier for many people, but can also have challenges in the field of education. These challenges may come in the form of classroom management, issues with technology integration, or lack of resources. The integration of technology, especially 1:1 iPad use, has had a significant impact on various aspects throughout the classroom. For example, providing students with easier access to differentiated learning materials, using game-based learning for student engagement, and allowing for all students to be included in the learning process. iPads are a tool that has been able to create lessons for students that allow for students to use creativity, provide better access to learning materials, and use various forms of progress monitoring to help keep students improving in specific target areas.

However, there are also challenges associated with using 1:1 iPads to promote students' academic achievement. For example, 1:1 iPads have been looked at as being distracting for students, creating problems with classroom management for educators, and taking away from peer interaction in the classroom. To properly engage the research question, educators must be able to look at how 1:1 iPads have affected students' academics, the role of game-based learning, and how iPads allow for all students to be included in the learning process. This topic is important to analyze because of the prevalence of technology and 1:1 devices within education.

Scope of Research

Educators are continuously finding new strategies for differentiating lessons in order to meet students' individual learning needs. Through the use of 1:1 iPads, educators are able to

provide easier access to resources that may help positively impact students' academic achievement. The purpose of this literature review is to examine a variety of quantitative and qualitative research articles that provide information on how elementary students' academics are positively impacted through the use of 1:1 iPads in the elementary classroom. The following topics were researched and analyzed: iPad effects on students' academics, the use of game-based learning in the classroom, various iPad applications, iPads in the inclusive classroom, students' engagement with iPads, and key findings in the research. The focus of the presented research is on iPads within education with an emphasis on the correlation between 1:1 iPad use and student achievement.

Importance in the Field of Education

Technology allowed for students to have greater access to educational resources. Warschauer (as cited in Thieman and Cevallos, 2017) stated, "The effects of technology on instruction are most likely when each student has access to an individual device" (p. 419). Technology in the classroom comes in many forms, with 1:1 iPads in the classroom being just one example. According to McKenna (2012), "The iPad is just one example of the many recent improvements in technology that have contributed to advancements in elementary education over the past decade. With a global boom in terms of communication technology, educational achievements have been fostered, and those improvements have made it possible to expand and expedite learning for children in the classroom" (p. 136). Educators have been able to create lessons through the use of 1:1 iPads to help deepen students' understanding of topics and enhance their learning experience.

With the field of education continuously changing it is important for educators to help students learn the necessary skills to help them be successful later in life. Technology is always

changing and has affected everyone to some degree. Through allowing for the use of 1:1 iPads in the classroom, educators have the opportunity to help differentiate their teaching for each individual student in order to help meet student needs.

Student engagement and the use of 1:1 iPads has transformed education over the past decade. Clark and Luckin (2013) stated, "iPads can support seamless learning, allowing learners to easily switch learning contexts- from formal to informal or personal to social- and to take control of their own learning" (p. 2). When students have the opportunity to take ownership of their learning, it helps promote students' engagement and focus on skills the students are interested in learning.

The research presented appeared to show that access to 1:1 iPads at the elementary level had a positive impact on student academic achievement. This is noticed through the variety of research articles examined throughout the literature review. This suggested academic achievement can be associated with the use of 1:1 iPads.

Research Question

The research examined the essential question: In light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement?

Connection to Program Essential Question. The essential question for the Differentiated Instruction program at Concordia University, St. Paul examined, "In light of what is known about differentiated instruction, how shall professional educators effectively teach every student?" The research was related to the Differentiated Instruction program's essential question through investigating how the use of 1:1 iPads in the elementary classroom have had a positive impact students' academic achievement. The research examined 1:1 iPads effects on

academics and how through proper utilization of differentiated instruction 1:1 iPads could be a helpful learning tool for elementary students to meet their individual learning needs.

Technology and students' academic achievement was examined throughout the current research. More specifically at the elementary grade levels. Many classrooms have been given numerous forms of technology in order to positively impact students' academic achievement. More specifically the use of 1:1 iPads in the elementary classroom. Researchers looked to examine the effects of 1:1 iPads in the elementary classroom, and whether this type of technology has had a positive impact on academics.

Definition of Terms

The terms chosen were important to the research in order for one to better understand the literature presented. It was essential to know how iPads, differentiated instruction, and technology integration are connected to the research question throughout the research that was analyzed in chapter two.

iPads. The term is a technology device that can be used for a tablet, communication, or a learning tool. iPads are a device that works together with other technologies. The device allows for a collection of data wherever learners are located (Clark and Luckin, 2013).

differentiated instruction. The term is an approach that focuses on different learners and different needs. The teacher carefully plans lessons using a variety of best practice techniques that are in the best interest of the students. The teacher must make adjustments to both engage and challenge learners in the classroom (Tomlinson, 2017)

technology integration. The term is the use of technology within the use of an educators' curriculum or lessons to help promote student success. This can also be related to how technology is introduced to an individual or group in order to ensure success and positive

outcomes. Technology integration in schools requires a focused plan on both teaching and learning, management systems, and to create a better learning experience for learners and parents (Clark and Luckin, 2013).

Summary

Technology in the form of 1:1 iPads can be a tool for professional educators to use in effectively meeting the needs of every student in their classroom. This paper looked to utilize research in order to explain the research question, in light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement? The following topics were researched and analyzed: iPad effects on students' academics, the use of game-based learning in the classroom, various iPad applications, iPads in the inclusive classroom, students' engagement with iPads, and key findings in the research. While analyzing the research provided, this will be able to help readers understand the influence of 1:1 iPads both in the short-term and long-term on students' academic achievement. In the next chapter, research was presented in order to show how the use of 1:1 iPads in the classroom has a positive effect on elementary students' academic achievement.

Chapter 2: Review of Literature

The research examined throughout chapter two focused on the positive impact of 1:1 iPads on students' academics. Chapter two research focused on the effects of iPads, iPad applications, game-based learning, iPads in the inclusive classroom, educators and iPads, and student engagement with 1:1 iPads. All of the topics examined helped the reader to understand the benefits of 1:1 iPads in the elementary classroom, but also some potential barriers associated with the use of 1:1 iPad technology. All of the research was related to the research question in

light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement?

Effects on Academics

In a journal article written by Chambers, Jones, McGhie-Richmond, Riley, May-Poole, Orlando, Simsek, and Wilcox (2018) they described how the number of iPads in schools was increasing, and the applications available in education was growing as well. Therefore, teachers and students were able to use technology to enhance learning in a way that was not available prior to the adoption of iPads. The purpose of this study was to examine how iPads were utilized in the classroom, how iPads supported learning, what support was given to teachers to help improve iPad use in the classroom, and what other supports teachers need in the future with iPads (Chambers, et al., 2018, p. 75). This was a qualitative study that used a survey to gain perspectives on iPad use in the classroom, and how teachers were implementing them into their curriculum. The participants in the study were from the United States, Canada, Australia, and the United Kingdom. There was a total of 427 teachers that took the survey on iPads amongst the four countries involved. The survey was online and was collected based on how the participants answered the questions. The surveys were collected over a span of three weeks. The researcher conducted a study on students and teachers' kindergarten through twelfth grade that were currently using iPads in the classroom to help support learning and academics.

Chambers, et al. (2018) stated: "Respondents' perspectives of student responses to iPads, was generally noted as very positive" (p. 77). A majority of the teachers from the various countries involved in the research responded that iPads had a positive impact on students and their classrooms. The study found that iPads were used to support learning and provide opportunities for practice. However, there were some limitations to the study. The study

showed a lot of variations in how iPads were being implemented in the classroom. Chambers, et al. (2018) stated: “While this is an important area, and an obvious one in schools, the use of the iPad to teach communication (55%), social skills (42.5%) and particularly functional skills (21%), was quite low when considering the extensive and pervasive support needs of the students” (p. 79). There were also limitations in that the participating teachers were inconsistent in the manner they integrated iPads into the curriculum. The authors suggested using more participants in further investigations.

Another article written by Dunn and Sweeney (2018) described the effects of using iPads in a primary classroom setting to help teach compositional writing. Three teachers and classrooms from Northern Ireland, and three teachers and classrooms from the Republic of Ireland, participated in the study. A total of six schools participated in the study of iPads and writing. This qualitative research study used interviews to conduct the research. The children in this study were 6 and 7 years old. Throughout the research, most teachers found that students thought the iPads were fun and engaging. iPads allowed for creativity and gave the students choice when using the iPads. The teachers also talked about how they liked that students could use them at both school and home.

However, there were still some limitations when using iPads for writing in primary grades. Dunn and Sweeney (2018) stated: “Four of the six schools mentioned the importance of having a balance between iPad and paper-based writing in their classroom” (p. 864). Many of the teachers agreed that not everything could be done on an iPad for composition writing in order to achieve academic success. There were also times when using paper pencil had its benefits as well. The authors’ findings concluded the need for balance when using iPads for writing in academics.

Retalis, Paraskeva, Alexiou, Litou, Sbrini, and Limperaki (2018) also studied how iPads were being used to enhance student learning in the classroom. Throughout this mixed-method study, the researchers used questionnaires and interviews to help conduct the qualitative portion of the research. The study also utilized statistics in order to complete the research. The researcher studied 11 public and private schools in both primary and secondary schools. There was a total of 1,072 students who participated in the research. Retalis et al. (2018) stated: "The findings revealed that students are more positive with reference to the iPad being an excellent tool that helps them organize and understand the learning content" (p. 226). The study also showed that it was important to understand how iPads should be implemented in the classroom. Teachers, students, and parents all needed to be able to understand the positives and negatives of having this technology in the classroom.

Similar to other studies, there were some limitations to the research. Retalis et al. (2018) stated: "A limitation of this study is the low levels of internal consistency of the survey questionnaire of students and parents"(p. 227). The researcher suggested better utilization of students, teachers, and parents in the research next time. The research was also limited to the students' academic achievement during that particular school year. It did not show how they improved once they had moved onto another grade level.

Through the use of 1:1 iPads in the elementary classroom, it is important for students to get continuous feedback throughout their learning in order to help meet their learning needs. The iPad has become a way for educators to give students immediate feedback on topics they may be learning. Attard (2013) described how the iPad was able to provide students with instant feedback. iPads also allowed students to make mistakes and correct the mistakes themselves. This encouraged student confidence and relieved students fear of failure (p. 2). Students able to

receive that immediate feedback allowed for students to become aware of their mistakes, and correct their mistakes right away. This can lead to students understanding topics being taught, and lead to more academic success.

iPad Applications

In light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement? iPad applications have been an engaging way to help students' use their creativity and problem solving skills to help increase students' academic achievement. In an article written by Zhang, Trusell, Gallegos, and Asam (2015) they studied the use of implementing engaging math applications on students' tablet computers in order to help learn mathematics in fourth-grade. Zhang et al. (2015) stated, "an exploratory study was conducted in an inclusive fourth-grade classroom, in which about half of the students were either at-risk or had disabilities" (p. 32). The students were only given three math applications to use on their tablets, all of which focused on decimals and multiplication. The students were given pre and post-tests in order to track the achievement results. The results of the tests were then used towards quantitative research.

The article described the demographics of the students involved in the study.

This study took place in a fourth-grade classroom at a public elementary school in an urban city in the southwestern United States. This school enrolled about 800 students, among which over 90% were Hispanic, and 68% were eligible for discounted or free lunch (Zhang et al., 2015, p. 34).

The students did not have any experience using iPads in school. The researchers used paper and pencil assessments to examine what the children learned by using the math applications on the iPads.

The researchers noticed students improved their performance after using the iPads and math applications on the given topic areas in mathematics. Zhang et al. (2015) stated: “This study found encouraging evidence on using math apps to improve student learning and close the achievement gap between struggling and typical students” (p. 38). The authors also noticed that through using iPads and math applications, students that struggled could achieve state achievement standards.

There were some limitations to this study. The authors noted the findings for this study were based on a small sample size, and the study was conducted over a short period of time. The authors suggested a larger sample size should be used in order to come up with more substantial evidence that iPads and math applications can help improve academics.

In another article, Bebell and Pedulla studied the effects of students having access to technology and if it is related to their achievement in the classroom (Bebell & Pedulla, 2015). This was a quantitative study that was studying kindergarten through third-grade students and whether or not iPads helped achievement in the areas of English Language Arts and mathematics. The study also researched how iPad implementation helped students’ academic achievement in an elementary school setting. The study used both pre and post-tests to obtain data.

The study took place in a public-school setting in Auburn, Maine. Bebell and Pedulla (2015) stated: “Across the school district 54% of students receive free/reduced lunch and the annual per-pupil expenditure reported for the 2010/2011 school was \$8, 052. In the 2010 census,

over 93% of Auburn residents identified themselves as White” (p. 195). The study looked at a control group and an experimental group. The control group did not use iPads, and the experimental group used 1:1 iPads. In the first study, there was a nine week pre and post test investigation on kindergarten students and how iPads were implemented to see student outcomes and if student achievement was measured. The second study was a longitudinal study that examined the first three years of iPad implementation and its effects on academic achievement.

The results from the first study showed there were positive outcomes related to academic achievement when iPads were implemented into the classroom. The study showed that throughout the nine weeks, many of the students improved using iPads in English Language Arts and mathematics. The longitudinal study showed various findings that did not provide strong enough evidence that iPad implementation over three years was related to academic achievement.

There were also some limitations in this study. One limitation was the difficulty to measure the outcomes for the implementation of iPads. Another limitation of this study was that it was only based on iPad implementation from one school district.

Carr (2012) stated: "Game-based learning apps could be used to facilitate students' problem solving and conceptual understanding of mathematics" (p. 273-274). In this research article, the researcher looked at how game-based iPad learning applications could be used in order to help students learn and help with their academic achievement. Throughout this study, fifth-grade students used various math applications in order to positively impact their academic achievement in mathematics.

Game-based Learning

Another article written by Najmuldeen (2017) looked at the impact of game-based iPad applications on academic achievement and retention in social studies. This quantitative quasi-experimental study looked at the impact of educational iPad games on students' academic achievement in social studies. The study used 48 sixth grade students from Jeddah (Najmuldeen, 2017, p. 21). The students were either in an experimental group or a control group. There were 26 sixth graders in the experimental group, and 25 students in the control group. Three students were gone for the study. There were pre and post-tests given to show the effects on the students' achievement in the area of social studies. The study looked at how the use of game-based learning allowed students to be engaged in their learning and helped them stay motivated.

In order to get results, the author interviewed students in the experimental group. The students were told they had to follow their teachers' instructions while using the iPads. The author collected data on the students' achievement of topics that were being taught using educational-based games on iPads. The author also looked at student behavior while using iPads. The students were then given a post-test to compare the scores of the experimental and control groups.

Carr (2012) conducted a similar study that examined whether or not game-based learning on the iPad may have an effect on student achievement. This study examined the effects of iPads on the achievement of fifth grade students in the subject area of mathematics. This took place at two rural Virginia elementary schools. Throughout the study, the researcher used pre and posttests in order to help obtain their data. There were 104 fifth grade students involved in the study for a nine-week period. Throughout the nine weeks, the control group did not use iPads while practicing mathematics, and the experimental group did use 1:1 iPads while practicing

mathematics. Carr (2012) stated: "The purpose of the current quantitative, quasi-experimental study was to examine the impact of iPad's use as a 1:1 computing device on fifth-grade students' mathematics achievement in two rural Virginia elementary schools" (p. 270). Game-based learning was something the researcher observed throughout the study. Carr (2012) stated: "Utilizing gaming in the mathematics classroom has its benefits" (p.273). When using 1:1 iPads during math games students interest was enhanced and time on task increased. However, there were some limitations to the study. Carr (2012) suggested having a study over a longer period of time. He also suggested using different mathematics applications with the students over a variety of grade levels. This would help to create a better analysis of the research that was presented.

Both studies by Carr (2012) and Najmuldeen (2017) were in agreement that it would be beneficial to research other game-based applications in order to study students' academic achievement. Najmuldeen (2017) states "Using iPad applications based on educational games supports and consolidates learning due to the interaction with material" (p. 32). However, there were also some limitations to the study as well. In further studies, the author suggested providing more teacher training in the use of iPad educational applications, providing teachers with a manual to create iPad applications in order to help engage learners, and utilizing other educational iPad applications to motivate learners.

Furthermore, Kaur, Koval, and Chaney (2017) suggested that by using the iPads, it helped students become more engaged and allowed for more student participation. Kaur et al. (2017) stated: "They wanted to spend more time with the apps to practice math and wanted to participate more than ever" (p. 119). Through using interactive math applications, the students were able to get instant feedback and earned virtual awards. This, in turn, helped motivate students. When students were able to use the iPad as a tool to use for educational games and

applications, it helped them stay more engaged and motivated. Teachers also noticed students were more willing to practice math problems.

iPads in the Inclusive Classroom

In a study conducted by Thieman and Cevallos (2017), the researchers looked at how 1:1 iPads were being used to help encourage educational opportunities and help with students' academic success. This was a mixed-method study that looked at how iPads could be used in low and high socio-economic classrooms to allow for access to a wide variety of educational resources. The study looked at, if having these mobile devices, whether or not it helped students improve their school attendance and create better academic achievement. The researchers conducted this study over a period of three years. 1,075 students participated in the study from Urban High School. Thieman and Cevallos utilized the use of surveys and survey data to conduct their research. Thieman and Cevallos (2017) stated: "The participants in this study were predominantly eligible for free/reduced lunch (87%), students of color (71%), English speakers (64%), and male (56%). In total, 21% received special education services while 30 percent of the students were identified as English learners" (p. 411). The research suggested, in order for iPads to be successful, it was important to have proper iPad distribution amongst students and teaching staff. Through having proper distribution, it would help to positively impact students' academic achievement.

In another study, Kaur, Koval, and Chaney (2017) looked at using iPads as a supplement to teaching students with learning disabilities in the area of math. This was a qualitative study that studied ten teachers' use of iPads while giving 1:1 iPad support to students with learning disabilities. This study was done over a period of five weeks, and each teacher completed a survey on the topic. The students were from a self-contained elementary school in the south.

The students utilized the use of various math apps and focused on meeting math standards. The teacher's focus was on helping to meet each student's individual learning needs. Through using these apps, it allowed students of various abilities to stay engaged in the learning content. Kaur et al. (2017) stated: "The iPads engaged all learners. It was a great tool for visual learners because certain apps demonstrated the steps involved in solving the problems" (p. 118). The iPads were able to promote learning and engagement, but also were a great way to involve all students of various learning abilities. However, there were some limitations to the study. Kaur et al. (2017) stated "The short duration and small sample size of this study warn against the generalization of the results to a larger population" (p. 120). The researcher suggested that by having a larger sample size it could have different effects on the results.

The results of both of these studies showed that, when iPads are used as a supplemental resource or as a 1:1 device, there were many positives. Both studies looked at how, through having various ways to access information, it could lead to academic achievement. Additionally, having access to educational resources through iPads helped create inclusion by allowing everyone to succeed and meet standards.

Educators and iPads

Educators also play a crucial role in the implementation of iPads and their success for student learning. In a journal article written by Vu, McIntyre, and Cepero (2014), they researched how teachers used the iPads in their classroom and how they felt about the success of the devices. This was a mixed-method study of both quantitative and qualitative research data to see the success or challenges of using iPads in the classroom. Throughout this research study, there were 21 elementary and secondary teachers from three different school districts that participated in the study. Two of the schools were public schools and one school was a private

school. These teachers did not have any formal training on how they used the iPad in their classrooms. The study first analyzed questions to the teachers about how they use the iPads and what they liked about using them.

The quantitative portion of the data collected dealt with how students were grouped using iPads and what the teacher's role was while using the iPads in the classroom. The study found the use of the iPad allowed teachers to use creativity and flexibility to help increase students' learning. Vu and McIntyre et al. (2014) stated: "Teachers could use the iPad to play video clips, search information on the internet and more importantly, they helped to illustrate concepts and allowed student to interact utilizing apps" (p.70). However, the qualitative survey data indicated the teachers felt the iPads were most useful when they had more access to them. Teachers that only had access to one or a few iPads did not see the benefit of using the technology devices in their teaching. The results showed that even though not all teachers agreed on how to use the iPads in the classrooms to help promote students' learning, that they would recommend them to other educators. Vu and McIntyre et al. (2014) stated: "It was interesting to realize that although not all teachers agreed that the iPad was really useful in their classroom, they all indicated that they would recommend their colleagues using it in their classroom" (p. 72). This indicated that, although not all teachers found the iPad useful in the classroom, there were benefits for both teachers and students having access to them.

Walsh and Farren (2018) also wrote about how teachers played a crucial role in helping to properly implement iPads into the classroom in order to meet students' learning needs in the primary school setting. This qualitative study took place at a private primary school in Ireland in an urban setting. The ages of the students participating in the study were between the ages of three and twelve years old. There were also 380 students and 87 staff members participating in

the study. The students came from different countries, cultures, and some with different first languages. Walsh and Farren (2018) stated: “There are promising signs that iPad use will bring about a pedagogical shift supporting enhanced student learning” (p. 168). Throughout the qualitative research, the teachers were interviewed to show the benefits of using iPads in the classroom and the negatives of using iPads in the classroom. Many teachers noted benefits, such as, using various iPad applications for student learning as well as allowing students to have more flexibility in their learning. The teachers also found it beneficial for students to be able to record their work. However, there were also disadvantages to iPads. According to the study, one disadvantage teachers noted was the lack of communication between students. Teachers also found the iPads hard to monitor while in use by students.

Both of the studies conducted by Vu, McIntyre, and Cepero (2014) and Walsh and Farren (2018) showed there were benefits to using iPads in the classroom to help academic success. However, there were some disadvantages as well according to the study conducted by Walsh and Farren. Both studies agreed that in order to properly support students in their learning through using 1:1 iPads that providing teachers with proper professional development was essential in order to help promote student learning and success associated with 1:1 iPad use. Also, both studies had limitations, such as small sample sizes. Getting more feedback from other teachers and a larger geographical area would have helped to support the notion that 1:1 iPad use helps to promote students’ academic success.

Another journal article was written by Ditzler, Hong, and Strudler (2016) looked at how 1:1 iPads are utilized in the classroom and the benefits of using this 1:1 iPad technology. The study conducted was through the introduction of iPads to 6,500 students in five Title One schools in a large metropolitan school district in the Southwestern part of the United States. Most of the

students in the school were eligible for free and reduced lunch. Throughout this qualitative study, classroom observations and interviews were conducted in order to obtain the necessary data for the research. All of the students in the study were familiar with the iPad because the study took place after the students had used the technology for 34 weeks.

The results of the research did not show if 1:1 iPad technology was able to positively affect students' academic achievement. The thoughts towards iPads in the interviews with both teachers and students were mixed and more research was still needed in order to come to a conclusion on the importance of 1:1 iPad technology in the classroom.

Similar to the article written Vu, McIntyre, and Cepero (2015) and Walsh and Farren (2018), Ditzler and Hong et al. (2016) stated: "The current study revealed the importance of effective teacher training in technology use, as well as the kinds of issues that need to be addressed in professional development courses, during both preservice and in-service training" (p. 190). The importance of proper teacher training is essential in ensuring teachers are comfortable with using 1:1 iPads in order to help students achieve academic success through 1:1 iPad technology in the elementary classroom.

Ditzler and Hong et al. (2016) also mentioned certain limitations associated with the research study. One limitation was the limited amount of time spent conducting the classroom observations. The researchers also mentioned that having a larger group of teachers to interview would have helped to get a more concrete analysis of how 1:1 iPads were beneficial in the classroom.

Student Engagement

In light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic

achievement? Student engagement played a crucial role in helping students meet their individual learning needs, and increase academic achievement. For example, when students used iPads it allowed for more flexibility and creativity in their learning. Regan (2015) wrote a research article called “The Impact of Individual iPads on Student Engagement in a Primary Classroom.” This case study looked to notice the effects of student engagement using 1:1 iPads in a classroom of 25 students. This was in a public school in a second-grade classroom. The study looked at student behaviors and tracked students not following the classroom rules. The study used observations and student interviews to help collect additional data. Within the classroom, there were 11 boys and 14 girls. Following the research, Regan conducted an exit interview with the whole class in order to share the findings of the research. This school was also set in a suburban public school in the Rocky Mountain region. The teacher in charge of the class was very familiar with technology and the options available using 1:1 iPads in the classroom. The data was collected through 17 hours of observation and student interviews.

The author also noted that during the observation students seemed most engaged when using the iPads. Regan (2015) stated: “During the observation periods, I noticed that most students were on-task during the instructional time that involved the use of the iPad” (p. 395). There were only a few students off-task during the instructional time when using the iPads. Some limitations to this study were the small sample size. This case study only looked at one classroom and one group of students. Although most students were on-task and highly engaged during the observations, there is still a lot of research to be done on the effectiveness of iPads based on student engagement. Regan (2015) stated: “Young children are interacting with technology at home and in the classroom. We need to ask ourselves, are we creating experts that utilize technology to help them think critically or are we providing some students with a high-

tech tool for distraction” (p. 396)? This statement by the author is a question that is continuously researched in order to help better understand the role of 1:1 iPads and if they have a positive impact on students’ academic achievement.

In a similar study, there was research conducted by O’Malley, Lewis, Donehower, and Stone (2014) which focused on the effectiveness of the iPads and how they helped autistic students engage. This qualitative study was conducted in a Maryland special education classroom with students that had moderate to severe special needs. The study used surveys to collect data. The students enrolled at the school were anywhere from kindergarten to eighth grade. The use of 1:1 iPads allowed students to have greater access to more resources. O’Malley et al. stated: “Technology is rapidly changing how educators engage students, deliver content, and manage the traditional classroom. New technology like the Apple iPad has enormous educational implications because it makes learning portable, mobile, and accessible” (p. 90). The article described how 1:1 iPads had been able to give students with special needs at the elementary level and beyond more access to resources that were not available previously.

Throughout the research, the students in the special education classroom were diagnosed primarily with Autism Spectrum Disorder. The study used a baseline test to assess how much progress was made based on interventions completed while utilizing the 1:1 iPads. This study was primarily focused on the content area of math. When analyzing the results of the study, O’Malley et al. (2014) stated: “If the student engages with the device in a positive way, it may extend the student’s willingness to use the device to support practice in other areas of study. Therefore, not only may the student be more motivated and engaged, it may serve to provide the same incentives for the teacher” (p. 96). The use of 1:1 iPads can help students with special

needs at an elementary level and beyond learn new skills to promote positive academic achievement.

Both O'Malley et al. (2014) and Regan (2015) agreed that future research was needed in order to fully understand the effects of 1:1 iPad use and its effectiveness on students' academic achievement. Using a bigger sample size in both studies would help to verify students' engagement using iPads and how that relates to student academic achievement. Regan (2015) stated: "Young children are interacting with technology at home and in the classroom. We need to ask ourselves, are we creating experts that utilize technology to help them think critically or are we providing some students with a high-tech tool for distraction" (p. 396)? Although, the research suggested 1:1 iPads had shown students were more engaged while using the iPads, there was still a lot of research needed in order to learn the lasting effects on student engagement and academics.

In another study, conducted by Gasparini and Culen (2011) looked at how iPads were used in the classroom and were associated with student engagement. In this qualitative study, the researchers used surveys and interviews to help them with their research. This study took place in one fourth-grade classroom in a rural part of the country. There were 26 children in the classroom, and the classroom received six iPads to use. The researcher wanted to find out if students were engaged in their learning and the effects iPads had on learning in general. All of the students were familiar with the technology and knew how to use iPads prior to the study. Gasparini and Culen (2011) also interviewed students' families to get their opinion on the benefits of iPads in the classroom. The surveys for the research were given after the first month of iPad use.

The results of the research had positive effects related to learning and academics. Gasparini and Culen (2011) stated: “We have observed, as well as heard from families, students, and the teacher that iPad has enhanced both teaching and learning. Students were more immersed in their reading and creative activities” (p. 4). The research showed that because students were more engaged in their learning students, teachers, and families felt iPads had a positive effect. This can be in turn related to students’ success associated with iPad use in the classroom.

There were also some limitations to the research. One limitation was the study only looked at one fourth-grade classroom. It would have helped to look at a wider variety of grade levels in the elementary school setting. Another limitation was the study only took place in a rural school. The study would benefit from also looking at a school in a metropolitan school district, and see if the results were similar.

iPad Integration

Another important aspect of 1:1 iPad use in the elementary classroom was through the use of proper iPad integration in the classroom. Not only did students need to feel comfortable with the technology, but the teachers also needed to be comfortable with iPads as well in order to help increase students’ academic achievement. In a qualitative study, Attard (2013) investigated two research projects involving iPad use. Both studies took place in a primary school setting in a mathematics class. The students also attended two different schools. In the first study, classrooms were given a set of 30 iPads for a six-month period of time. In the second study, each classroom was only given access to six iPads. The research was completed through observation and interview questions with both students and teachers.

Attard (2013) mentioned many benefits to the iPad technology that were noticed through observations. Attard (2013) stated: “The need to incorporate the iPads led the teachers to become

more creative in their lesson planning and as a result tasks became more student-centered” (p. 2). Although there were many benefits associated with iPad use, there were also some disadvantages between the two studies. The classroom with a limited number of iPads became difficult to manage because not every student could work on the iPads at the same time. Attard (2013) stated: “The disadvantages of the iPads related mostly to technical and management issues, such as the sourcing and uploading of appropriate applications, difficulties associated with record keeping and supervision of students while using the iPads, and the problem of how to allocate the limited number of iPads between students” (p. 2). Both studies agreed that proper professional development for teachers was crucial in helping 1:1 iPad technology be successful in the classroom. This, in turn, helped improve students’ academics by having a more student centered approach and allowing for immediate feedback and creativity when using 1:1 iPads.

Similar to the article written by Attard (2013), Ditzler and Hong et al. (2016), stated, “For successful implementation of new technologies in teaching and learning, perceptions of students and teachers on how new devices are used in the classroom can help determine difficulties in implementation and inform strategies for future development and implementation in school” (p. 189). Both researchers agreed that in order for any type of positive effects to take place, such as on academics, there must be a plan for successful implementation of these 1:1 devices. This plan can be from the perceptions of both the teachers and the students.

Attard (2013) also noted some limitations to the study. One limitation is that both studies only took place in a mathematics primary classroom. Further studies, may want to look at other subject areas. Another limitation was that only two schools were researched for this particular study. In the future, looking at more schools would help to get a better understanding of the

lasting effects of 1:1 iPad use and implementation, and how it correlates with students' academic achievement.

Key Findings

Throughout the research, it was noticed that in order for 1:1 iPads to have a positive impact on academic achievement there must be proper iPad integration. This is often attained through teachers being trained through professional development to learn new strategies about how to best utilize these technology devices. It is also important to ensure students are engaged while using 1:1 iPads. The iPad had been able to provide students with the opportunity to use their creativity, provide immediate feedback, and provide flexibility in students' learning. All of these could help to have a positive impact on students' academic achievement in the elementary classroom.

Conclusion

Throughout the research explored, there was great evidence that suggested iPad use in the classroom had a positive impact on student achievement. Through the use of proper iPad and technology integration, student engagement, and using game-based learning, the use of iPads can help create a positive learning environment that promotes success. Also, by providing students with a variety of ways to learn, it can help promote an inclusive classroom. Though there is still a lot of research that needs to be done, there are many benefits to using 1:1 iPad technology in the elementary classroom. Overall, the use of iPads and technology in the classroom had positive effects on academic achievement, especially in the short-term. The long-term effects of iPads and academic achievement appear to be inconclusive. The next chapter looked to summarize the research as well as the findings of the research based on how it relates to the research question.

Chapter 3: Research Summary and Conclusions

Review of Problem

The literature review in chapter two examined a number of research articles in order to address the research question, in light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement? The literature review used an assortment of research articles in order to identify how 1:1 iPads in the elementary classroom promote academic achievement. The research reviewed topics such as the effects on education, game-based learning, iPad applications, educators and iPads, as well as numerous other topics. The focus of the research investigated how the research showed the benefits of 1:1 iPads and how they affected students' academic achievement.

Importance

This topic was researched because technology changed the way educators instructed students and helped meet students' individual learning needs. The use of 1:1 iPads in the elementary classroom helped students achieve academic success was something that continued to be researched in order to help educators create engaging and meaningful lessons while using best practice strategies. The use of 1:1 iPads in the elementary school setting had been a way to engage students, allowed students to use their creativity, as well as allowed students to get immediate feedback when they made a mistake or did something correctly. The research topic also created a better understanding of how both educators and students' felt about the use of 1:1 iPads in the elementary classroom.

Summary

The research looked to analyze the benefits of 1:1 iPads in the elementary classroom and how they affected students' academic achievement. However, the research also examined limitations to the studies and potential negatives to utilizing 1:1 iPads in the classroom. The research first examined how 1:1 iPads affected academics. The journal articles researched concluded that iPads in the classroom were a helpful classroom tool that supported student learning. However, the research identified needed balance, and both educators and students needed to know how to properly use the iPads in order to be beneficial to students' academic achievement. Another benefit identified was the use of 1:1 iPads in the elementary classroom allowed students' to be able to receive immediate feedback in order to help them correct mistakes. When students were able to correct mistakes, it allowed them to better understand the topics taught.

The research also looked at the use of game-based learning, while using 1:1 iPads, supported academic achievement in the elementary grades. The research found game-based learning engaged and motivated learners. This also allowed for more student participation in learning new skills and topics. Game-based learning also provided students with immediate feedback. This was found to be beneficial because students stayed engaged in their learning.

Other findings in the research also suggested iPads were an effective way to include all students in the learning process. Through having 1:1 iPads, learners could work at their own level and were given multiple ways to access information. However, the research also suggested that in order for 1:1 iPads to be used effectively, educators and students must be given proper training in order to understand how to properly use the devices. Educators played a crucial role in the effectiveness of 1:1 iPads in the elementary classroom. Educators surveyed felt when

students had access to 1:1 iPad devices they were a useful learning device. Educators noticed students had more flexibility in their learning and used various iPad applications that promoted learning and academic achievement.

The research showed iPad integration was also a crucial aspect relating to 1:1 iPad use and students' academic achievement. The research suggested that in order for iPads to be a valuable learning tool in the classroom there must be a plan for how iPads were introduced for both educators and students. Educators must have been provided proper professional development in order to learn effective utilization of 1:1 iPads in the elementary classroom. Studies found educators who were not given professional development to learn how to use 1:1 iPads in the classroom did not see the iPad as helpful as teachers who used 1:1 iPads to differentiate lessons for all learners to achieve success.

In addition, the research studies also analyzed some potential drawbacks to using 1:1 iPads in the elementary classroom. One study suggested iPads caused students to have a lack of communication with one another. This study was an outlier compared to other studies researched. Students were more focused on the devices and not learning proper communication skills. Another study noticed iPads caused classroom management issues. Educators found iPads hard to monitor what students were working on. Another potential drawback researchers noticed was the need for proper iPad integration. If iPads were not properly integrated into the elementary classroom, both educators and students did not use the 1:1 iPad devices to their fullest potential. Educators needed proper professional development and students needed to be familiarized with the iPads in order to understand how to properly work the learning device. Researchers also noticed iPads, if not integrated properly, were a tool for distraction rather than

for learning. Researchers also suggested 1:1 iPads be used in moderation and not used as the primary learning device.

Conclusion

To conclude, the research looked at many benefits of 1:1 iPad usage that promoted academic achievement. The research looked to answer the research question, in light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement? The findings of the research suggested the use of 1:1 iPad devices had positive effects on students' academic achievement in the short-term. However, the long-term effects of iPads and academic achievement appear to be inconclusive. Nevertheless, through the use of proper iPad integration, student engagement, and using game-based learning, the use of 1:1 iPads helped create a positive learning environment that promoted academic success. The next chapter will look at how educators can apply the research and suggestions for future studies in order to help meet all students' learning needs.

Chapter 4: Discussion/ Application/ Future Studies

The research examined how professional educators can effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement provided many insights into both the benefits and challenges of using 1:1 devices in the elementary classroom. Although the research suggests 1:1 iPads help students' academic achievement in the short-term, the long-term effects appear to be inconclusive. Therefore, it is important to note that in order to address the research question, in light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact

student academic achievement? one must examine the existing research evidence and decide the best approach to meet the learning needs of all students.

Insights Gained

Throughout the research, it is apparent that in order for 1:1 iPads to be effective, there needs to be a plan for technology integration. This is to ensure that educators and students are comfortable in using the iPads. For educators, they need to have proper professional development to help them learn how to create lessons and differentiate their teaching methods to help meet students' learning needs. Educators also need to feel supported when first getting to use 1:1 iPad devices in order to promote academic achievement. The research suggests teachers who do not have proper professional development training or do not feel supported, are less likely to have confidence in using 1:1 iPad devices in their teaching.

Another important insight the research examines is the importance of using 1:1 iPads as a learning tool, but should not be used as the primary source of student learning. There needs to be a balance in how students are learning. The research shows how educators can differentiate their lessons by utilizing 1:1 iPads to help promote elementary students' academic achievement. However, iPads should work with other teaching methods in order to get the best results from these 1:1 devices. It is equally important for students to also learn effective communication skills and not become dependent on their iPad. Ineffective communication skills could create adverse effects of utilizing these 1:1 iPad devices in the elementary classroom.

1:1 iPads can also help create an inclusive classroom for all students to achieve academic success. The research indicates 1:1 iPads allow for all students to be part of the learning experience. Educators have the ability to create lessons at students' readiness levels in order to help meet their learning needs. When all students are involved in the learning process, they will

be able to have flexibility in their learning as well as use their creativity. This can help lead to improved instructional practices by providing students with a variety of ways to learn while promoting flexibility and creativity in order to promote academic achievement.

Another key insight the research examines is the use of 1:1 iPads and student engagement. The research shows students are more engaged in their learning when using the iPad. Students were able to use their creativity and have flexibility in their learning, which allows the students to stay more engaged in the learning process and helps promote academic achievement. This allows educators to create meaningful lessons while using best practice strategies to help meet students' individual learning needs.

Limitations

Although much of the research suggests 1:1 iPads in the elementary classroom help to promote students' academic achievement, there are some limitations as well. The research shows 1:1 iPads help students academic success in the short-term. However, the long-term effectiveness of 1:1 iPads is inconclusive. This is simply because much of the data and studies conducted does not follow students throughout their educational careers. This makes it difficult to get concrete evidence that 1:1 iPad use has a lasting effect on students' academic achievement. Another limitation is that many of the research articles looked at a small sample size from one area, or focused on one particular subject area. A way to make the study more relevant is to have a greater sample size, while also looking at how 1:1 iPads affect a variety of students from different parts of the world. For example, analyzing multiple grade levels at once to notice the effects of 1:1 iPads on students' academics throughout a whole elementary school. This would give a better understanding of the effectiveness of 1:1 iPads on students' academic achievement.

Application

This research applies to educators who are currently using or will be using 1:1 iPads in their classrooms in order to positively impact students' academic achievement. The research can be used to ensure iPad integration is done properly to help both educators and students feel comfortable using this technology device. Along with proper iPad integration, educators need to be given proper professional development to help them learn more about how to differentiate their teaching using the iPads. This would also allow time for questions and collaboration with others who are already using 1:1 iPads in their own classrooms.

The research also gives educators insight as to how 1:1 iPads are a helpful learning tool for student engagement. The research shows 1:1 iPads allow for flexibility and creativity for student learning. Students are also able to stay engaged in their learning through the use of immediate feedback. This is beneficial for educators and students because students learn what mistakes they have made and can fix them immediately. This helps to prevent students from making the same mistake continuously. It also helps educators gain valuable information immediately and differentiate their teaching to meet students' learning needs. Game-based learning is another aspect the research suggests as a tool for student engagement. Using various iPad applications, students can learn the necessary skills to positively impact students' academic achievement, while still staying engaged in the learning process. For example, using multiplication math applications to help students learn basic math facts. The math application will be able to keep the students engaged while helping to reinforce students' math fact fluency.

Future Studies

One suggestion for future studies is to have a study follow students who use 1:1 iPads throughout their entire elementary school career. Such a study would be able to give a better

understanding of the long-term effects of 1:1 iPads on students' academic achievement.

Although the short-term effects on students' academic achievement suggest 1:1 iPads have a positive effect, research will be needed to determine the long-term effects.

Another suggestion for future studies is on the different forms of iPad integration. Since the research shows iPad integration is crucial in promoting students' academic achievement, it also is helpful to ensure educators and students are able to use best practice strategies to meet students' individual learning needs. A study analyzing various schools iPad integration, and how it affects students' academic achievement, would be helpful in providing it educators' guidelines to follow when integrating 1:1 iPads into their classrooms.

Additionally, a study further investigating 1:1 iPad use as an engagement tool would be beneficial. Although there is a significant number of research suggesting students are more engaged in their learning when using 1:1 iPads, the research also identifies iPads can create distraction. This, in turn, can cause problems with classroom management. Future research could look at how students become engaged in their learning and the duration of time students are able to stay focused on their learning with so many other distractions that are available on these 1:1 devices.

Conclusion

To conclude, in light of what is known about differentiated instruction, how do professional educators effectively use 1:1 iPads in the elementary classroom to positively impact student academic achievement? The research on 1:1 iPads in the elementary classroom appears to positively impact students' academic achievement and shows their effectiveness in the short-term. This occurs when proper professional development has occurred. The proper use of iPad integration is also crucial in helping to ensure educators and students are utilizing these 1:1

devices to their greatest potential. However, the long-term effects on students' academic achievement appear to be inconclusive. There is still a great amount of research that needs to be completed in order to identify 1:1 iPads as a positive learning tool and not a learning tool that is a cause for distraction.

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