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# Are You Afraid of Technology? Effects of 1:1 iPads on Standardized Assessment Scores

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Are You Afraid of Technology? Effects of 1:1 iPads on Standardized Assessment Scores

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A capstone project submitted to the Department of Education and Human Development of The College at Brockport, State University of New York in partial fulfillment of the requirements for the degree of Master of Science in Education.

### **Abstract**

Lack of support at home and in school can be seen as the reason for low standardized test scores and/or low literacy skills. This study reviews the impact of technology (specifically 1:1 iPads) on students' summative assessments by quantitatively analyzing the results achieved by the same teacher over a two-year period. The assessment includes results for each school year. Additionally, this study qualitatively examines the lessons, the training, and the implementation of the technology by the cooperating teacher to better understand its benefits. Results show that students who were taught using iPads displayed more growth and higher scores compared to those who did not. This growth came as a result of better course content organization and more opportunities for communication by teacher and students alike.

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## **Chapter One: Introduction**

What is the most stressful aspect of teaching? Is it the wide range of personalities and reading levels in your class? Is it trying to engage students on a day to day basis? What do you do with the students who are ahead in their work while you're focusing on groups or individual students who need more attention and support? Then you throw parent contact into the blend of daily stressors of teachers. How do you find the time to communicate with parents regarding upcoming assessments, getting their child extra help, or just general announcements? The life of a teacher can and will be overwhelming at times. Wouldn't it be easier to find a tool that would answer all the questions above...?

### **Problem Statement**

This study will look at the effects of using 1 to 1 iPad devices for instructional purposes and how this impacts student achievement.

### **Significance of the Problem**

Technology is a growing tool in classrooms around the world. In an ever-changing profession, the standards for assessing educators are changing as well. This research will look specifically at student achievement on 9th grade global history assessments, and the impact that using iPads has on improving these test scores. If technology is so important and worth the money districts pay, then it should have a positive impact on scores.

### **Research Question(s)**

1. How will the use of iPads in a social studies class affect student assessment outcomes?
2. What level of teacher training supports effective use of iPads for instruction?
3. What skills do effective iPad implementation support relative to student learning?

**Purpose of the Research Study**

The purpose of this research is to prove the effectiveness of technology use, specifically iPads, in the classroom. Research shows that technology assists teachers in many ways, but it does not look specifically into student achievement reflected in the assessments that students take throughout the year. This research hopes to demonstrate that the use of technology (iPads) does indeed have a positive impact on student achievement as seen through their growth on 9th grade global history assessments.

**Rationale**

Using iPad devices for instruction is a fairly new initiative that is only a few years old. Some schools are pushing for iPads rapidly, others more slowly, and some not at all. Susan Greenfield (2015) points out that the iPad has been one of the most rapidly growing technologies in the United States. She goes on to state that 70% of the lists (enterprises using iPads) were US schools. Over the years, the iPad has become increasingly popular in schools. Based on the day-to-day pressures such as the questions listed above, along with CCSS (Common Core State Standards), school initiatives, APPR (Annual Professional Performance Review), and student's assessment scores, teachers have not had the time to learn how to effectively implement iPads for instructional use. Young (2016) argues and proves that teachers say one thing, but don't often follow through. For example, in a study completed this year in Ireland (over 22 secondary schools), 91% of teachers stated that they intended to use iPads to communicate (with peers, students, and parents); however only 65% of those teachers actually used the tool for that purpose. Schools attempt to hold teachers accountable with iPads through various strategies, but it's impossible to really know who's using the tool correctly on a daily basis. Hu and Garimella (2014) state, "According to a 2013 report by Blackboard and Project Tomorrow (Evans, 2013), 45% of principals would like new teachers to integrate student-owned mobile devices into lessons, but only 19% of aspiring teachers stated they

knew how to do this”. How does one know if the tools are really working and benefitting the students?

### **Methodology**

In order to determine the effectiveness of using 1 to 1 iPad devices for instruction and how this impacts assessment scores, I will first analyze the pre, mid, and post assessments of the 2014-15 school year when students do not have access to iPads. I will then analyze the same data from the students of the 2015-16 school year when students have access to their own iPad devices. Lastly, I will interview the teacher to determine his opinion on effectiveness of the technology compared to years past (without 1-to-1 iPads), and why his students’ data reflect those beliefs.

### **Chapter Two: Literature Review**

Technology continues to grow each day and has had a large impact on education over the course of the last decade. Because technology is constantly evolving, students and teachers are demanded to evolve as well. Schools around the world use technology as a tool in and out of the classroom at all grade levels. Tools such as iPads, Smartboards, lap tops, and other devices can have a large impact on both students and teachers. This impact does not come cheap. Because school districts put so much money toward these tools, they expect that they will be implemented correctly and consistently. Schools provide teachers with professional development, planning periods to reflect and learn, and surveys to express their likes and dislikes of district initiatives. Additionally, teachers have the pressure to learn and implement new technology along with more initiatives such as state standards and other programs implemented by the school district. Technology has the potential to shape and change education forever.

This study investigates the effects of using 1-to-1 iPads on student achievement as demonstrated on 9th grade assessments. As mentioned above, teachers have various pressures (literacy standards, content standards, program standards, etc.) each day on top of the traditional

school day. Technology is supposed to make teaching easier, but it seems that it sometimes makes it more difficult. Imagine having to use a tool that your students know more about than you do.

Wouldn't that be uncomfortable? What's the worst that could happen? The reality is, technology is becoming more present in the classroom today than ever before. Districts are paying more than ever before as well. Our government spends nearly \$50 billion annually in education and training of technologies such as these. Shouldn't teachers know whether or not these technologies have an impact on the standardized assessment scores that they as teachers are rated on?

When looking at the most current research regarding the use of technology, iPads have not become relevant in classrooms until the last couple years, but technology has been present in classrooms for the last two decades. When looking at technology in general, and focusing more on iPads, three general themes emerged from the research: effects on literacy, teacher training and implementation, and effects on student achievement.

### **Effects on Literacy**

Technology can have a large impact on education for a variety of reasons. It can be used for reviewing learning through games, supporting students grappling with difficult text, or translating language for foreign students having trouble communicating with their teachers and classmates.

**Literacy and the language barrier (non-native language speaking students).** Imagine being a student in a new country. Now imagine being a foreign student at the college level. The requirements of college can be overwhelming, and then add on the barrier of communication. In her research, Hilary Hughes (2013) is focused mainly on the international students' informational literacy experience and needs and how these affect a truly inclusive classroom. Hughes focuses on the students and their interactions with the resources, specifically (Hughes, figure 1.1) languages-cultures, learning-help, strengths-challenges, affective responses, and reflective responses. These interactions often present challenges (information overflow, finding reliable sources, etc.) to

international students that need assistance from their library and teachers. The students' affective responses were mostly negative according to observations, surveys, and interviews, but their reflections revealed how they could improve in the future. Hughes concludes with future research showing insights from other cultures and universities, sharing curriculum for an inclusive international class, exploring positives and negatives of technology universities, and examining how teachers can use this study to create a truly inclusive and global classroom that does not label international students as special needs groups.

Robert Kozma looked into the problem that Hughes poses in regards to a curriculum of technology based instruction for international education. Kozma (2003) was able to look into schools from 28 different countries that incorporated technology in their instruction and determine (based on observations, surveys, and interviews with panel members) what programs were most successful and what those programs entailed. The biggest results came from research based projects where students were able to choose their topic, collaborate with others, and present the information to the class. Also, it showed what subject areas and grade levels yielded the best results. Secondary sciences were the best. This is similar to Hughes' study in that it looks into nations outside of Australia and lessons where international students learned best with technology. Mango (2015) looks at foreign language students enrolled in Universities in the United States and how their growth as students was tied to engaging activities using an iPad. Mango used a questionnaire with the foreign students to reach his conclusions, as well as the types of lessons and activities used by the instructor. Mango concludes that iPads enhance students' learning and engagement, impacting their overall success because of increased collaboration and interaction. Mango provides insight as to the engagement levels of students using iPads for instructional purposes. Also, he examines student opinions about using iPads. Henry Becker and Jason Ravitz (1999) looked into the impact that technology has on United States teachers' lessons, practices, and perceptions. They examined

the pedagogical effect that Hughes concludes is needed for these foreign students to be successful in developing informational literacy skills. Technology has helped foreign students in college become more acclimated with the new language and culture.

### **Teacher Training and Implementation**

Over the last few years, schools around the world at all levels have been implementing iPads. This push requires schools to provide teachers with training on iPads, on the applications that are associated with them, and on how to best implement the iPads in their classrooms. Some of the common concerns include the following: what applications and programs teachers have been successful with, how is training and professional development implemented for teachers, and what has yielded positive results from teachers.

**Applications and support.** Focusing more on the impact of iPads on today's education, Churchill and Wang (2014) looked at the use of iPads in higher education, and the beliefs that teachers held regarding the use of this technology. The goal of the article was to provide a framework as to how to successfully implement this technology into higher education. This article paints a picture as to how iPads are effectively used in a classroom, each with their own applications and skills. Churchill and Wang conclude that the iPad should "serve as a tool for activities, support, and evaluation, and where more emphasis is placed on collaboration, connectivity, representational possibilities, and analytical uses." This is similar to Hargis, Cavanaugh, Kamali and Soto's (2014) research that looks at the first major wave of iPad implementation in education in the United States. Specifically, these authors looked at teachers' perceptions of iPad use in the classroom using "student-centered learning experiences." The authors used case study interviews, surveys, and an iPad lead team to determine their conclusions. This team concluded that students are empowered when they become independent researchers, and teachers should act as the facilitators. These researchers also concluded that students are used to

being told what to do, as opposed to working independently using inquiry. Students also stated that they feared missing any instruction when learning new applications. This research was very helpful because it provided data and research on specific student-centered lessons.

**Literacy building skills and applications.** Kim and Catapano (2006) look into the effects that technology (informational literacies) has had on student achievement. Kim and Catapano concluded that students' scores increased (reading at a higher grade level than they started), and that teachers learned more about lesson planning and using technology in these lessons. Kim and Catapano were able to look into lessons that assisted students academically and socially (reading/writing levels and communication). Incorporating technology into classrooms can create a truly diverse world to help students think more globally. Technology can also help culturally, linguistically, and academically diverse students communicate and perform more closely to their peers for a truly diverse classroom. Kelly (2005) looks into the effects that technology, specifically games on iPads, can have on students' assessment scores. Kelly, like Kim and Catapano, uses review games that focus on specific skills aligned to state standards and district goals.

**Needed professional development.** Hu and Garimella (2014) look into the growing use of mobile learning (using tablets, iPhones, smart phones, etc.) in secondary STEM (Sciences, Technology, Engineering, and Mathematics) classrooms. Hu and Garimella focus on the professional development of teachers during a summer training sessions and research teachers' willingness to use iPads, beliefs on the usefulness of iPads, proficiency using iPads, and application of knowledge and skills of incorporating iPads into daily lessons. Overall, the research based on teacher surveys concluded that the iPad is a useful tool for teachers when developing their daily instruction. The iPad helps teachers design lessons that motivate students and help the students solve real-world problems. Jhurree (2005) also looked into the importance of professional development for teachers on technology use in the classroom. This study develops a list of priorities

and guidelines for districts to follow (in developed and developing nations) in order to implement a successful ICT (Information and Communication Technology) program. The findings were realistic, looked at all perspectives, and created guidelines based how countries handled similar issues with technology to those that developing nations are facing today. Hargis, Cavanaugh, Kamali and Soto's (2014) research concluded that successful programs provide support to teachers. Overall, teachers will implement a tool when they are more successful with it. Once teachers have had the proper training, they are able to troubleshoot any issues students may have, maximizing instructional time and giving students more support.

### **Effects on Student Achievement**

The main purpose of this study was to look into the impact that the iPad initiative had on 9<sup>th</sup> grade student achievement. These assessment scores often contribute to a teachers' overall effectiveness rating on local annual professional performance reviews (APPR). If students' scores go up, then teachers are often rated as effective. If assessment scores go down, then schools, parents, and community members become concerned about teachers' abilities relative to student learning.

Schacter (1999) first began looking at the effects of technology on student achievement. The purpose of this study is to look at the impact of technology on learning. In order to complete this study, Schacter uses local, state, and national studies, as well as other smaller studies that have examined uses of technology in learning and instruction. Overall, the goal of this study was to "summarize the positive and negative impact of various technology studies on student achievement." The study showed that positives outweighed the negatives, but the biggest outcome was that technology in classrooms is only as effective as the lessons and teachers that utilize this resource.

Song Kim and Susan Catapano (2006) look into the effects that pre-assessments (data) and technology (informational literacies) have on student achievement. Kim and Catapano concluded that students' scores increased (reading at a higher grade level than they started) with the use of the iPad in various classrooms. Kim and Catapano were able to incorporate both data and pedagogy with their research, and showed that technology helped below average students achieve successful results to shorten the gap. Unlike the research discussed in previous sections, Kim and Catapano use data and pedagogy together to guide their research. The results proved that technology with diverse learners can help close the gap between this population of students and their classmates in regards to standardized test results.

### **Chapter Three: Applications and Evaluations**

This researcher examined the impact of iPad use for instruction in a 9th grade global history class from a western New York semi-suburban school district. Students' assessment scores from this course were studied to determine if using iPads for instruction increased student achievement. A random class from upstate New York from the 2014-15 and 2015-16 school years was analyzed. In the 2014-15 school year, students did not have access to individual iPads. All students did have access iPads in the 2015-16 school year. Students' pre-assessment scores were compared to their assessment scores throughout and at the end (post-assessment) of the year to determine if the iPads are indeed a useful instructional tool to the teacher and students. This researcher focused on the student achievement growth to determine the impact of iPads on students' education reflected in their 9th grade global history assessment scores.

#### **Participants**

The participants in this study include the participating teacher and teacher, and a randomly selected class out of the participating teacher's 5 total global 9 classes. The exact school district and students are not identified in this study.

**Setting**

The setting is a global 9 classroom. The classroom is in a western New York semi-rural suburban school district. The school is made of 52% male and 48% female. Its ethnicity is 92% white decent, 3% Hispanic or Latino, and 1% African American. The school has a 10% classification of disabled students. Of the total population, 22% of students are economically disadvantaged with 24% of the students qualifying for free or reduced lunch. The school district has a graduation rate of roughly 95% over the last three years. The school follows the Common Core State Standards and implements a program called the International Baccalaureate program (IB) that infuses globally minded practices and college skills into lessons. Classes are on a block schedule four out of five days per week. Each class is one hour in length and forty-five minutes long on Fridays only.

**Methods of data collection**

The pre, mid, and post global history assessment from the 2014-15 and 2015-16 school years were used for the purpose of this study. The data looked at one random class from two separate school years and focused on the growth of these students' assessment scores using the constant comparative method. The participating teacher, who teaches global studies, was interviewed using a questionnaire to determine the impact of technology and training on his students, himself and his department as well.

**Procedures**

Data was first compiled from two consecutive school years. The first school year (2014-15) examined the students' progress without iPads. The next school year (2015-16) reviewed students' progress with iPads and compared that data to the previous school year to determine the effectiveness of 1-to-1 iPad use for the effectiveness of instructional purposes.

An open-ended interview was used with the global history teacher to determine the comfort level, training, and implementation of this initiative. An examination of iPad implementation was

conducted to determine the effectiveness of the activities and applications that were used on a daily basis and the homework assigned to students using the iPads. This information showed if there were any differences in instruction compared to the previous school year.

### **Trustworthiness**

This study was conducted over two semesters where professors and professionals from a Western New York college helped develop and approve this research. This study was broken up into various steps and stages to scaffold the process. This researcher met with a professor and received feedback throughout the process of this research. This study was approved by the Institutional Review Board (IRB) before the research could be gathered, analyzed, and used.

This study can be trusted due to the steps taken to protect the rights and privacy of the participants involved. This study uses 9<sup>th</sup> grade assessments to show the impact that the 1-to-1 iPad instructional initiative has made on a group of students over the course of a school year. Students' names are not attached in any way to the test results or anywhere in the study.

### **Positionality**

At the beginning of this process, this researcher was working with at-risk students in this study's school district teaching grades 7-12 in all subjects. Students in this class had access to their own iPads depending on their grade level. Students in grades 7-10 had their own iPads, while students in grades 11-12 did not, but they did have access to computers in the classroom. This researcher was able to gain an understanding and appreciation for using 1-to-1 technology through this study. Additionally, this researcher was also able to work with students on assignments that incorporated using iPads for the participating teacher's class. This researcher has participated in the 1-to-1 initiative and taught the International Baccalaureate curriculum at the school district featured in this study.

This researcher currently works with special education students grades in 7-8. The focus with these students is attentiveness, organization, and accountability. This middle school offers 1-to-1 netbooks in each class, but not iPads (and students cannot bring these netbooks home). The students of this school have significant gaps in their literacy skills with both reading and writing in comparison to their classmates. The classes of this school also have access to 1-to-1 laptops in all core classes that do not have 1-to-1 netbooks. This researcher has been able to work with students and staff on developing lessons and activities that use the technology in inquiry-based lessons. This researcher also uses the technology and programs with parents for collaboration and communication on assignments.

This researcher has also worked in a title 1 school in South Carolina where students had access to 1-to-1 iPads in school only. Students at this school would get their iPads each morning from their last period teacher and would return the iPads at the end of the school day to the cart in their last class. Students were not able to bring their iPads home for any reason. Students at this school were significantly below grade level in reading and writing. The district's initiative was to close the gap with the use of technology-based practices. Teachers received training for 40 minutes every other day, as well as once a quarter on superintendent's conference day. This researcher was able to understand the benefits of technology to close the literacy gap for students in need in the first full year of teaching professionally.

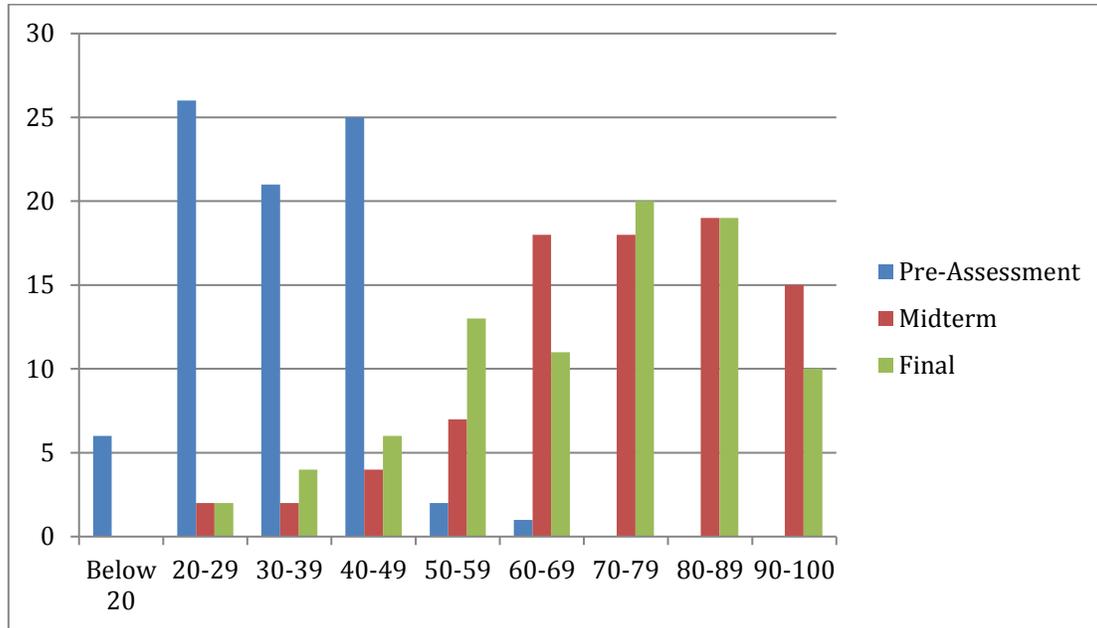
#### **Chapter 4: Analysis**

The outcome of this research was very positive. The findings as follows: (1) assessment scores showed more growth with the use of iPads; (2) teachers and students benefitted from the use of iPads for instruction as tools for organization, research, and communication; and (3) teachers and students became more comfortable through training and practice.

## Assessment Growth

The focal point of this study was to concentrate on the assessment scores of students. Two groups of students were used for this research (one that used the iPad and one that did not), and both with the same teacher over the course of a school year (40 weeks). The assessments used included a pre-assessment given at the beginning of the year, a midterm given at the end of 20 weeks, and a post-assessment given at the end of the year. The assessment scores showed a few things. First, the pre-assessment scores were very low both years. Second, the students showed growth from assessment to assessment. And third, the students showed more growth during the year when they used 1-to-1 iPads.

**Dramatic increase.** Figures 1.1 looks at the amount of students for each score (100-90, 80-89, 70-79, 60-69, 50-59, 40-49, 30-39, and 20/below) for the 2014-15 school year. These numbers show a progression of low pre-assessment scores to higher mid and post-assessment scores. The numbers are noteworthy because of the amount of students that failed the pre-assessment. Pre-assessments are designed (like midterms) to give a teacher a snapshot of what the students know. This will help a teacher better prepare materials and activities for class, as well as the possibility of having to reteach specific lessons or concepts. The chart then moves to the midterms and post-assessments where students scored much better. Later sections will get into more depth about the possible reasons as to why so many students scored low on the pre-assessment compared to the midterm and post-assessment.



*Figure 1.1* 2014-15 Assessment Data (Pre, Mid, and Post) showing the total number of students (y-axis) for each score, and the percentage range (x-axis) they scored in.  
 \*Note- This school year did not have 1-to-1 iPads for students.

This is much the same with figure 1.2 (below) for students in the 2015-16 school year. When looking at these numbers, a few things stand out. First, a vast majority of the students for both school years failed the pre-assessment. Not only did they fail, but a strong majority had scores between 20-39%. This could mean a couple of things. One, that the pre-assessment was designed to be hard. Many teachers who have the ability to design their assessments (separate from state assessments) are able to make the tests harder at the beginning of the school year to show growth on their midterms and finals. Second, this could mean, could be that the students possessed very little knowledge regarding global studies entering the class.

Unlike US history, where students learn about some topics in elementary and middle school, global studies is first taken in high school. Throughout elementary school in grades 1-6, students are exposed to US History. Entering 7<sup>th</sup> grade students begin learning subjects with various teachers for

each class. For example, students in 7<sup>th</sup> and 8<sup>th</sup> grade now have their own social studies teacher, as opposed to one teacher for all their classes. In 7<sup>th</sup> and 8<sup>th</sup> grade social studies, students learn about American history covering topics from Native American migration to North America, all the way to current US history (early 21<sup>st</sup> century). In summary, students have learned only about United States history from 1<sup>st</sup> grade all the way through 8<sup>th</sup> grade.

In grades 1-4, students work through various standards (both content and literacy based) that they will encounter in middle school and high school. According to the March 2016 New York State standards, these include gathering and interpreting evidence, chronological reasoning, geographic reasoning, economic systems, and civic participation (among others not mentioned). In grades 1-3, students focus primarily on the roles of individuals and groups within a society. Once students hit 4<sup>th</sup> grade, they begin to look at the geography and history of New York. Grades 1-4 focus primarily on the basics and local aspects of history.

In grades 5-6, students then begin to look at a broader picture of history in the United States and the world. In 5<sup>th</sup> grade, students look at aspects of civilizations, European exploration to the Americas, as well as the geography, culture, government, and economics of the Western Hemisphere. In 6<sup>th</sup> grade students look at the same concepts developed in 5<sup>th</sup> grade but as they apply to the Eastern hemisphere. This is where students get a quick and broad look at cultures on the other side of the world. Students do not look much into the specific names or cultures of this region.

When students hit grades 7-8, they leave the global concepts introduced to them in 6<sup>th</sup> grade, and go back to the concepts that were introduced in grades 1-5. In grades 7-8, students focus on the history of New York state (briefly in 7<sup>th</sup> grade), and the history of the United States. For the next two years, students move from the late 15<sup>th</sup> century to the early 21<sup>st</sup> century of the United States.

The only global terms and concepts they learn about are those that affect the United States and have impacted our nation in some way.

Once students enter 9<sup>th</sup> grade, they now begin learning about global history. Global history covers the main events in various countries for 9<sup>th</sup> and 10<sup>th</sup> grade. Global history covers large areas of land that students have never studied before, introducing new names, languages, customs, and religions to students. Global history also covers a much larger time period. For example, students learn about American history covering the 15<sup>th</sup> century (Colonization of America) to the 21<sup>st</sup> century (today). Global history looks at nations such as China who's history dates back all the way to 771 BC. The complexity and rigor of global history is due to the amount of nations and time this period covers in comparison to what students have learned in grades 1-8 with American history.

9<sup>th</sup> grade in general is also the first school year where students are exposed to regents type questions in social studies. In grades 7-8, social studies teachers collaborate and design their pre, mid, and post-assessments for the school year. Teachers design their own exam questions and structures. 9<sup>th</sup> grade is different because teachers now are using the structure of a regents exam which entails 50 multiple choice questions, a DBQ essay with extended response questions, followed by a thematic essay. This is the structure of pre, mid, and post assessments throughout 9<sup>th</sup> grade global history. The tasks are more rigorous, time consuming, and require students to practice their reading, writing, and time management skills to a greater degree than in earlier grades.

The 10<sup>th</sup> grade global regents exam covers the material taught in both 9<sup>th</sup> and 10<sup>th</sup> grade. Teachers and students must review these concepts throughout the year so the material stays fresh in the student's minds. For example, every lesson of the participating teacher involves sample regents questions from previous units using the most frequently asked questions from previous regents exams. This gives students exposure and review of these concepts throughout two school years. Using these questions and the same format as the 10<sup>th</sup> grade global regents, teachers can better

prepare students for the rigor and task that they will endure at the end of 10<sup>th</sup> grade. Many students enter 9<sup>th</sup> grade without exposure to tasks such as a thematic essay.

The thematic essay can be quite challenging to students in comparison to the DBQ essay. In previous grades (grades 1-8) students write DBQ essays, and in some schools “enduring issues” essay (new to the curriculum as of the 2016-17 school year). A DBQ essay consists of 5-8 documents, each with corresponding extended response questions. Teachers scaffold students in grades 1-8 to read these primary documents (maps, graphs, charts, paintings, speeches, etc), annotate them, and answer the questions in complete sentences. Students then organize an essay in which they use these documents and questions in their papers. Students feel more comfortable with DBQ essays for two reasons. One, they have had more experience with them in previous grades and have had the proper training to be successful. Two, students have answered questions for each document to use in their essays. The answers to the questions of the DBQ are in the documents themselves. Students don’t need as much background knowledge for a DBQ essay because they have information to pull from the documents and questions. This is different compared to the thematic essays.

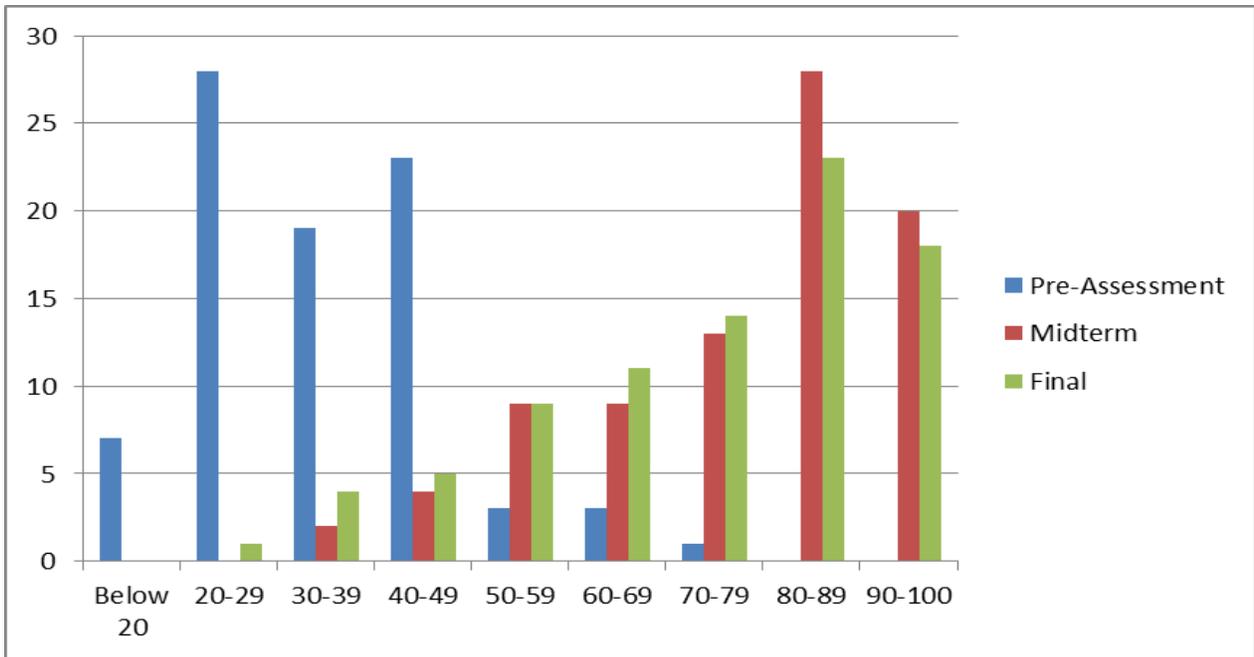
Thematic essays are generally more challenging for students because it requires only outside information. Students in this section are given a prompt (generally a question) and are able to choose from a list of figures or events that relate to the prompt. For example, the August 2016 Global Regents exam had a thematic essay prompt asking “Throughout history, belief systems and their practices have influenced societies and regions.” In their essay, students need to discuss the beliefs of that religion and how the beliefs impacted people of a specific region of the world. Students are then given a list of possible religions to choose such as, “Buddhism, Christianity, communism, Confucianism, humanism, Islam, Judaism, legalism, and Shinto.” Students are able to pick the religion they know most about and develop an essay that answers the prompt. Many

students struggle with this because they have not had the training in previous grades to generate the background knowledge. Also, students don't have documents to draw information from if they get stuck or confused. All of these reasons (new test format, new tasks such as thematic essays, larger time periods over new countries, and more rigorous assessments) are reasons why 9<sup>th</sup> grade students could struggle on a pre-assessment in global compared to a midterm.

Figure 1.2 (next page) looks at the data from the 2015-16 school year. This data shows that the students show similar growth than they did in the 2014-15 school year, assessment to assessment. One could think that as the school year progresses, students have learned study methods, structure and style of their teacher, and the background knowledge needed to help them succeed unit to unit. For example, students can improve on their test scores midway through the year in comparison to their first test of the school year. With the first test of the year, students do not know the structure, type of questions, or length of their tests. After the first test, students are better able to prepare because they now know what to expect and study for. This could be reflected in the growth between the pre-assessment to midterm assessment results. Students were better able to prepare and had more background knowledge to bring to the exam and subsequently, did much better.

When looking at the midterm scores as a whole, one can see that these scores increased dramatically. For both school years, 98.8% of the students showed individual growth from the pre-assessment to the midterm. The pre-assessment on the 2014-15 school year had an average test score for all students of 32.8%. This is compared to an average test score for all students of 34.3% in 2015-16. These are low numbers, but the midterm gets much better. The average score of the midterm in the 2014-15 school year was 73.1%, while the 2015-16 school year average was 76.7%. These numbers could possibly be inflated due to the factors mentioned above, but the most

important outcome from reviewing this data was the growth from assessment to assessment (pre-assessment to midterm and midterm to final).



*Figure 1.2* 2015-16 Assessment Data (Pre, Mid, and Post) showing the total number of students (y-axis) for each score, and the percentage range (x-axis) they scored in.  
 \*Note- this school year used 1:1 ipads for students

**Assessment to assessment.** When reviewing the data, the biggest outcome was the growth from assessment to assessment. When looking at the numbers for the 2014-15 pre-assessments compared to the midterms of that school year, 98.8% of the students showed growth in their assessment scores. When comparing the midterm to final of that same school year, only 23.5% of the students showed growth. We know that less students passed (65% and above) the final of this school year than the midterm. The results show that 69.4% of the students passed the 2014-15 midterm compared to 65.9% of the students who passed the final. The trend was much the same in 2015-16 where 77.6% passed the midterm and 68.2% passed the final.

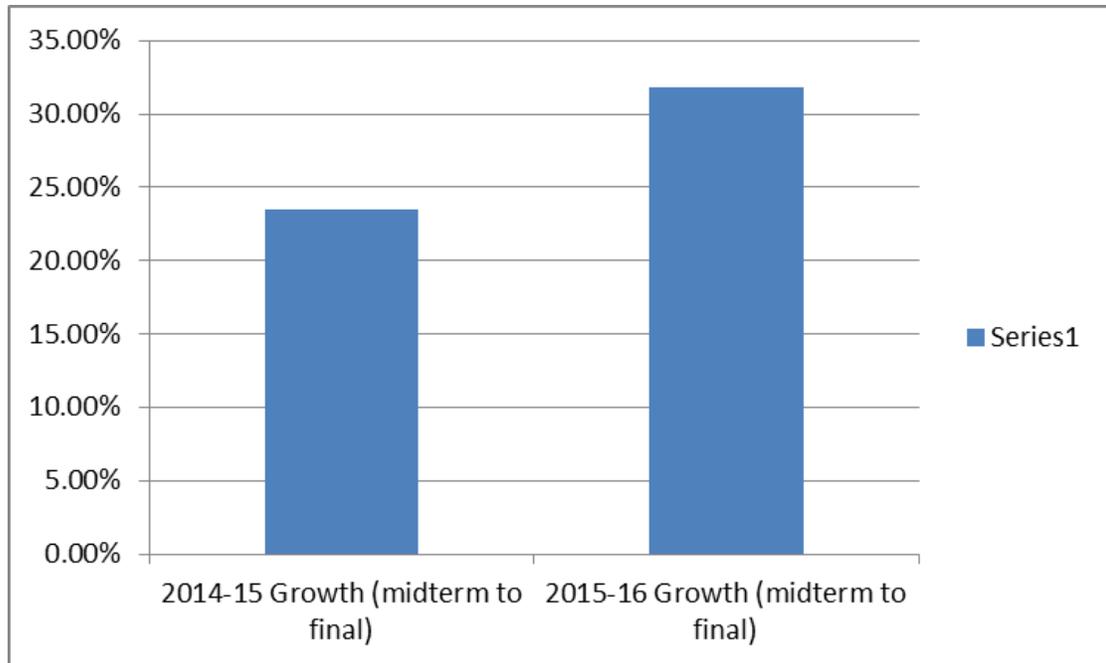
The average score for the midterm in 2014-15 was a 73.1%, while the final was a 69.6%. In 2015-16, the midterm average was 76.7% and the final average was 73.1%. In 2014-15, 24.7%

achieved mastery on the midterm and 22.4% of the students achieved mastery on the final. In 2015-16, 37.6% of the students achieved mastery on the midterm and 30.6% achieved mastery on the final. These statistics reflect the scores and intelligence of the students, but do not tell us the true impact of the iPad on students' assessment scores.

The statistic that will give the best comparison between the school years will be the growth of the students. This will determine if the use of iPads was indeed positive, if the 2015-16 students show more growth than the 2014-15 students. Whatever year shows more growth will most likely confirm the instruction during that school year was more effective for that group of students.

**Positive effects from iPads.** The purpose of this study is to explore the effects of 1-to-1 iPads on student achievement relative to 9th grade summative assessments. This researcher believes that iPads have a positive effect on instruction, which would positively affect students' assessment scores. The scores reported above show how students did on the specific tests, the numbers compared from exam to exam, but the most important data shows the growth of students by the end of the year. This will prove that the instruction for that year was more effective than the previous school years, no matter who the students were.

After looking at the growth from pre-assessment to midterm, it shows (as mentioned earlier) that 98.8% of the students achieved higher scores on the midterm than the pre-assessment. Both numbers are the same, and this does not tell us much. However, when looking at the growth from the midterm to the final, this researcher found that more students showed growth during 2015-16 (with iPad instruction) than 2014-15 (without iPads). Figure 1.3 shows that 31.8% of the students had higher final scores and midterm scores in 2015-16, as opposed to 23.8% of the students in 2014-15.



*Figure 1.7* Growth from midterm to final (out of 100%) in 2014-15 and 2015-16

The data shows that more students grew during the school year when students had iPads compared to the school year when students did not. This is important to note. It is also important to consider the instruction and use of the iPads in the classroom. It is vital to look into the instruction in the classroom to see how and when the iPads are being used. Becker and Ravitz (1999), Kozma (2003), and Mango (2015) state that it is important and vital to look into the teachers' lessons and use of technology to determine impact on student achievement through assessment scores. Is the use of technology daily, weekly, or not at all? Do teachers have proper training to use iPads for instructional purposes? Do the students? Is this something that teachers are held accountable in their lessons?

## **iPads and Instruction**

After looking into the assessment results of the students, it is important to examine how the students got the results they did. Under the pressure of common core state standards (CCSS), schools, teachers, parents, and staff have been searching for better ways to improve their instruction. The iPad is one resource that many schools have adopted as an instructional tool to assist students in learning the necessary literacy skills required on standards-based assessments. This section will look into the perspective of the teacher regarding the use of iPads. The findings are as follows: (1) the iPad allows students (and teachers) to build skills such as communication, organization, and research that are reflective of the common core standards; and (2) that teachers receive training using iPads for instruction to be able to support student learning.

**Building common core knowledge.** Based on the questionnaire, this study's participating teacher reflected on his teaching before and after the use of 1-to-1 iPads in his classroom. The overall impact was a success. Before using iPads, he stated that he used a lot of paper handouts and required students to use a hard binder to organize the handouts; and that he tended to do more note taking and lecturing and did limited active learning and group work. The cooperating school has shifted to the International Baccalaureate curriculum demands student participation in active, inquiry-based lessons. These lesson, skills of inquiry, and global-mindedness are reflected in the studies of Kozma (2003), Cavanaugh, Kamali and Soto (2014). The use of iPads has enabled this study's participating teacher to create more engaging and inquiry-based lessons that match the curriculum of the state and the district. For inquiry-based lessons, students need to conduct more research and create questions to drive their learning. These are skills that the students will need for college. Evident in this research and study, college students are required to research the work of others to apply to their own. With the use of the iPad, students have access to the internet, teacher

resources (posted on applications such as Google Classroom, Google Docs, and Google Drive), video lessons, and anything else they may need to guide their research, ensure their success, and to prepare them for college.

Before the use of iPads, this study's participating teacher also stated that the students really needed support with accountability, organization, and content knowledge. iPads help with accountability through the submission of assignments. Students can no longer say they lost their work (organization and accountability) with the use of applications such as Google Docs, Google Drive, and Google Classroom. These applications are implemented by the district and used in almost every classroom depending on each teacher. For most students, especially in-coming 9th graders, organization is crucial for school. Many students lose their work, binders, and folders. Many students forget to write their homework and due dates in their agenda. With iPads, students can assess their homework on the Google applications and view the due dates at their leisure. Many teachers also share this access with parents as well. With the use of iPads, students no longer have to pay for and carry around 2-3 inch binders with loose papers to each class. Lockers are no longer packed with binders and folders for each subject.

Since using iPads in each class, this study's participating teacher stated that the biggest advantage was "organization and not losing papers." He goes on to state that another big advantage is having access to class resources at all times. How many times has a teacher been asked, "I was out sick? What did I miss?" Or, "I am going on vacation next week. Can you give me the work for the next few weeks?" With an iPad, students will have access to these resources at all times and no longer have an excuse for missing work while they're away. Having access to resources online is nothing new and something students will encounter in college and the workforce.

Asked if iPads prepare students for college and their future careers, this study's participating teacher states, "I believe they do, as Blackboard is taking over colleges and many fields (banking,

education, real estate) are going paperless.” In teaching, the paperless initiative is taking hold of many schools. Bank statements, paying bills, and even receipts for dinner can be done paperless now through email. The use of Blackboard in college can be seen as a similar to the use of Google Classroom in high schools. Both are used for assignments, grades, and announcements. Teachers and students can communicate with each other regarding their work, learning, and questions. Learning has now become a collaborative effort reflective of the work that students will see in college and the workforce. Communication in this process is crucial and is one of the key components of the common core curriculum.

Communication and collaboration are two skill sets that students will need for any field they enter after high school and/or college. Reflected in the works of Churchill and Wang (2014), secondary teachers can best prepare students for college by giving them ample opportunities to work and communicate with their peers. This will teach students team-work, perspective, and accountability expected in the workforce. According to this study's participating teacher, as the school year (2015-16) with iPads progressed, students became “very fluid in organization and communication.” By using ipads in the classroom, students are given more opportunities to communicate with each other through inquiry-based projects, collaborative assignments on Google Classroom and Google Docs, and student-centered lessons. This study's participating teacher states that before the use of iPads, he “tended to do more note taking and lecture and limited active learning and group work.” The iPad creates more possibilities for teachers to provide students with lessons that enrich their communication skills. This is a process that enables students to build these skills, along with the content. However, like anything, there are also some weaknesses.

According to this study's participating teacher, there were also some minor downfalls to the use of the iPad during the 2015-16 school year. Some of the downfalls include but are not limited to the following: (1) distractions such as games, internet, or other school work and (2) electronic

breakdowns with the internet or the iPad device. Students can be distracted by anything, but the unlimited possibilities of the iPad make some teachers worry that students will be more focused on the wrong things and miss the content or lesson. This is an understandable concern; however, it is up to the teacher to provide the structure and classroom management to avoid distractions so students are focused on the right work. The school should also be responsible for providing training and collaboration opportunities for teachers to reflect on their use, concerns, and benefits of this initiative. The network breaking down is less common than a copier breaking down. These concerns; however, are noteworthy and reflect the fears that many teachers have when given an initiative such as this.

Based on these concerns shared by many teachers, one could expect initially that the 1:1 iPad initiative was not necessarily met with welcome arms. This study's participating teacher states that “not all” department members “were welcoming” of this new device. As stated above, Young (2016) proves that many teachers want to use technology in their classes, but the large majority tend to fall short. As anticipated, many teachers saw the concerns listed above as a challenge in teaching students literacy skills and content for standardized assessments, not to mention the training needed to use a device such as this for people who have never seen one. Many teachers do not know the programs, applications, and benefits of using such as a device. Through proper training, effective professional development, and iPad use in the classroom, teachers can begin to understand the benefits of this device, especially used in a 1-to-1 setting. Good professional development and teacher training allow educators to become more comfortable with such a tool, which will benefit the students as well.

### **Training and Development**

When approached about the iPad use in his classroom, the participating teacher states that, at first, the process was “overwhelming, but I knew several years ago it was the future of education.”

He goes on to say that it was not the iPad itself that was stressful “but the electronic organization, research, and teaching.” Many teachers face this sense of being overwhelmed. What helps teachers become more confident and comfortable using the device is professional development offered by schools, feedback from peers who have used the device, and opportunities in the classroom to practice.

As any teacher knows, each school is different in the professional development they offer, when and where it is offered, and by whom it is offered. Some schools have their own employees teach the courses, while others hire outside organizations that have more experience or resources to offer teachers. Various schools can offer professional development during planning periods, throughout the school day, after school, or over the summer. Many schools offer various options to give teachers opportunities to advance their skills in all aspects of teaching. There are two questions to ask: Do teachers take advantage of these opportunities? And do the schools provide enough opportunities?

When professional development is offered, the largest consideration is determining teacher participation. This study's participating teacher states that “courses are offered in professional development in the summer and the school year.” This study’s participating teacher does not state when in the school year professional development is offered. He also uses the word “offered,” so one could wonder if it is required or simply something the teachers have a choice in attending. Given the constantly-changing responsibilities of a teacher, one can understand a teacher's need to balance the demands of his professional practice with personal obligations. This means that sometimes training that is not required of a teacher may not take precedent over grading, meetings, preparation for classes, and even one’s personal life.

This study's participating teacher states that “minimal professional development is offered during the school day or during school meetings such as team, department, or faculty meetings.”

This could be part of the frustration of department members that caused discomfort with this initiative. Based on this researcher's experience at the school site, more professional development is offered after school and during student release days. Most teachers would find it hard to complete professional development after school for a variety of reasons such as family, coaching, and graduate school. If professional development is offered during the school day, the school then needs to find subs to cover the teachers' classes that are attending the professional development. This is often a burden on the school district, as it is difficult to find large numbers of substitutes. Both scenarios present their own positives and negatives.

Ultimately, teachers need training in areas such as using technology in the classroom. This study's participating teacher believes more training is needed and does not specify when the training should be. Training and professional development will better the school as a whole for multiple reasons. First, it will make the teachers more comfortable and willing to use the device. When asked if teachers were held accountable for using the device daily, this study's participating teacher states that the initiative is "encouraged but not monitored." If teachers are not held accountable for using the device, it's easy to imagine that they will avoid using it if they're not comfortable with it. Hu and Garimella (2014) proved using the Blackboard and Project Tomorrow (Evans, 2013) that more than half of new teachers fall short of using technology in the classroom due to their lack of training and experience with the tools. Training will provide teachers applications that will benefit the students and make their lives easier. Overall, training will benefit both teachers and students but finding time is often an issue.

### **Summary**

Overall, the use of iPads with this study's participating teacher was a success. Students showed more growth in 2015-16 than in 2014-15 when students did not use iPads in this setting. It was also determined that students showed growth in the areas of organization, communication, and

accountability while using the iPads for instructional purposes. The skills of organization, communication, problem-solving, and collaboration are key elements in social studies standards and are reflected in the global 9 assessments. The data suggests that iPads better prepare students for the rigor and literacy-based work expected of today's learners in a global history classrooms.

### **Chapter 5: Conclusions, Limitations, and Implications**

This study was able to paint a more vivid picture showing the effects of 1-to-1 iPad use for instruction on student assessments. Four conclusions came out of this research: (1) students assessments showed more growth with the use of 1-to-1 iPads in comparison to without iPads; (2) students showed growth assessment to assessment, mainly from midterm to final assessments; (3) iPads benefit students in the areas of communication and organization, which are vital for students in all subjects and grade levels; and (4) teachers need the proper training for using applications and programs for instructional purposes with the iPad.

This study proved that iPads lead to increased assessment scores in the classroom. This study also shares with teachers useful ideas and practices for using iPads for instruction. Some of these implications include the following: (1) applications and activities teachers can use in their classrooms with iPads; (2) the benefits of organization and executive functioning skills in the classroom for students success; and (3) the benefits of communication and feedback in the classroom to give support.

Although this study proved to be very useful, there were some limitations that could be completed by future researchers to make the study more valuable. Some of these limitations included: a) missing in-depth look at the teaching practices through specific lessons and activities, b) no student input in the strengths and weaknesses of iPad use in the classroom, c) did not use the same teachers over the two-year period, and d) did not look at the specific questions or tasks given on the pre, mid, and post assessments.

## Conclusions

This research proved that iPads have a positive impact on global history assessment scores. This study focused on the pre, mid, and post-assessment scores of two separate school years (one without iPads and one with iPads) with the same teacher but different students. In addition, this study's participating teacher completed a questionnaire reflection on his perception, comfort, and use of the iPad. The results showed that students who used the iPad for instruction showed more growth in a school year when compared to students who did not use an iPad.

Following the analysis of the data, it suggests that iPads are a successful tool in preparing students for the rigorous literacy standards in secondary global history assessments. The iPad presents students with various tools such as Google applications including Google Docs, Google Classroom, and Google Drive that allow the student to give and receive feedback from their teacher and peers. The iPad allows students to view videos and lessons to support their learning when they need additional support or re-teaching of the material. The iPad allows students to collaborate with classmates away from the classroom and potentially from around the world in order to become more globally minded citizens. The iPad has applications such as Notability that allows students to annotate texts (primary or secondary source documents) in a more creative and engaging way. Lastly, the iPad allows students to keep track of their materials and organize their work so they are no longer losing or forgetting anything.

The research also showed that in order to use the iPad effectively in the classroom, teacher's need proper training and time to complete professional development. Each school is different in the way they handle professional development, but teachers need proper training in order to be comfortable and knowledgeable with these new devices. More often than not, students tend to know more about technology in a constant-developing world than teachers. It is vital for teachers to learn

the applications and tools that will benefit their students so they can utilize these to develop students' literacy skills and troubleshoot any issues before they come up.

Overall, the iPad helps students with the organization of work, assignments, and computer applications. The use of the iPad also allows students to collaborate and communicate with classmates and/or peers around the world. It allows students to keep their work for every class in one area that is very manageable. The iPad also allows students to use the internet to answer and inquire into higher level questioning and research. These skills mentioned above are vital for students in post-secondary schools (college and/or trade schools) and the workforce. The literacy skills that students develop using the iPad in a 9th grade global class will carry into their rest of their lives.

### **Implications**

The positive implications for teachers who use iPads is clear. Students who used iPads for instructional purposes showed more growth in their assessment scores and were better able to organize their work and collaborate with their peers. If teachers can spend more time modeling, practicing, and guiding students with their work, less time will be wasted, hence maximizing instructional time. Student will be better prepared for class and more confident with the work they're doing if they have clear access to these resources in and out of school. This study has also showed that the iPad is instrumental in developing literacy skills of students.

One of the main benefits of technology in the classroom, according to this study, was organization. Students were able to keep track of their materials for each class using applications such as Google Drive, Google Classroom, and Google Docs. They also had access to applications such as Notability for their note taking and classwork. The Google applications are available on laptops and iPads, as well as students' phones. These applications are used for organization, assignments, and announcements. All of this can be accessed from school and at home. Parents, as

well as other teachers and tutors, can have access to these items from anywhere, which in turn benefits the student and teacher. For example, if a student is struggling in a class and has a tutor after school, the teacher can simply share the work with the tutor and monitor the work of the student with the tutor. Parents can access class notes, assignments and assessment dates from home to better keep track of their child's education. Technology allows more people to become invested and organized with their child's education.

Another benefit of technology according to this study was the communication and collaboration that flourished with and between students. These skills are linked to the CCSS for all subject areas, and it applies to most fields students may enter following high school or college. With the use of 1-to-1 technology in the class, students and teachers can access the work of others. Students can blog online with anyone from around the world with internet access about any given topic. Teachers can design discussion boards for students to interact with one another from anywhere in the world. Students can also access video calling programs such as Skype or Facetime to visually see and speak with someone from anywhere in the world.

As mentioned in chapter 4, many students in global 9 and 10 tend to struggle with their thematic essays due to lack of experience and preparation in comparison to DBQ essays. Technology such as the iPad gives teachers and students the opportunity for more meaningful practice and feedback on applications such as Google Docs. Writing in general is a rigorous task, and often, that students need ample support to be successful on writing based assessments such as the global history thematic essays. Teachers can give students individualized feedback much quicker and easier with the use of technology.

Teachers in classrooms without technology (ipads and laptops) can benefit from this study as well. In schools without technology, teachers can learn about the importance of organization relative to student growth. Teachers try their best to assist students with organizing their binders,

folders, and agendas, but there is not enough time in the day to ensure that this is getting done properly with every student. Some students who really struggle with these skills have accommodations in place that allow them to get organizational support throughout the day in organization. Teachers with 1-to-1 technology in their classroom have the assistance of these organization skills with doing minimal preparations other than creating a Google Classroom or a folder on Google Drive.

Although every teacher does not necessarily have technology in their classroom, this study has proven the impact of iPads for instructional use on student growth relative to 9th grade global history assessment scores. If teachers do have technology in their class, this study has shown them the benefits of organization and communication through various applications (Google applications, Notability, etc.), and the importance of teacher training to become more knowledgeable with these applications. Overall, this study has showed teachers and schools the importance of technology in the classroom and the impact it can have on supporting both teachers and students. It also showed that students learn skills, such as communication and collaboration, through the use of iPads for instructional purposes.

### **Limitations**

As this study began, various limitations were noted. First, this study did not have an in-depth look into the lessons of the teacher. There was no true insight as to the activities that were performed in the classroom through teacher lessons. Also, there was no collection of student work to show their progression and regression in between assessments using the iPad (or not using the iPad). Second, this study did not look into the perspectives of the students. Rather than interviewing the students, this research focused more on the teacher of the class. This is because the teacher has the knowledge of the standards and curriculum, as well as the experience of what has worked (and not worked) for decades as a career teacher. He was able to present a vivid picture as to the effect of

the technology on student growth based on the 9th grade global history assessments. Third, this research did not look at the same set of students both years. This study looked at the growth of two sets of students in two separate school years with the same teacher. It did not look at the growth of the same students over a two-year period. Lastly, this study did not give any insight into the specific questions on the assessments (pre, mid, and post). This is important because it would have shown the difficulty level of the questions on the pre-assessment as opposed to the midterm and final. This could have had a significant impact on the growth rate of students' assessment scores. Overall, this study was able to show the positive significance of technology based on student achievement using 9th grade global history assessment scores.

### **Recommendations**

Based on the section above, this researcher believes there are a few changes that could be made with future research and studies. These recommendations include, but are not limited to the following: (1) focusing on the specific standards for literacy and content areas with technology integration; (2) using teachers' lesson plans to analyze the standards, curriculum, and technology that are incorporated in each day; and (3) incorporating the perspective of the students. By using these recommendations, a researcher could study the impact of technology on literacy and standards based assessments.

Focusing on the specific standards for literacy and content areas will allow researchers to better understand the applications and support that technology offers. For example, a standard such as providing textual evidence is a curriculum expectation starting in elementary school. By focusing on the specific literacy standards tied to each lesson, researchers will have a better understanding of the impact that literacy skills such as reading, writing, and citing textual evidence could have on student success in assessments. Researchers could then help other teachers design better lessons to

incorporate these skills using technology that would allow students to grow during a school year to show more growth on their future assessments.

The lesson plans of a teacher would be very helpful in future studies because it would give us a more vivid picture as to what the teacher is doing between assessments. Future researchers would benefit from getting unit and lesson plans from their cooperating teacher to better understand how the assessment scores are being used to tailor future instruction. The researchers could then understand the day-to-day growth of students and teachers using the technology.

Future researchers should use student input to better understand why they have displayed more growth. By interviewing the student, researchers could have a better idea about the knowledge of content and technology that students are bringing to the classroom. The researchers would also be able to better understand what applications and activities that students have found most useful and interesting. This would help create a truly differentiated classroom and would benefit teachers everywhere. The most useful information to any teacher is student input, and this is something that could provide a great benefit to any research study.

### **Overall Significance:**

The findings illustrate the impact of technology on 9<sup>th</sup> grade global assessment scores. It shows that the use of 1-to-1 technology in the classroom has led to student achievement as demonstrated by the positive growth rate of students' 9<sup>th</sup> grade global history assessment scores. Technology use has led to improved organization, communication, and collaboration. This directly benefited the students in this classroom. These skills are vital for students' literacy growth and are reflected in the assessments given throughout the school year. The findings of this study can benefit teachers of any subject area, especially those who have technology in their districts and classrooms.

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