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Program Evaluation of a Laptop Initiative for Student Learning

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Walden University

College of Education

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Thomas O'Hara

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the review committee have been made.

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2018

Abstract

Program Evaluation of a Laptop Initiative for Student Learning

by

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MA, New Jersey City University, 1999

BS, Lock Haven University, 1985

Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

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Abstract

Administrators of a New Jersey school district implemented a 1:1 laptop initiative in Grades 6-8 in 2013 to bolster student achievement. An evaluation had not been conducted to ascertain the effectiveness of the initiative. The purpose of this study was to examine the effect of the 1:1 laptop initiative on student achievement. The conceptual framework for this study was Stufflebeam's context, input, process, and product evaluation model. The focus of the research question was the differences in New Jersey Assessment of Skills and Knowledge math scores between students involved in the 1:1 laptop initiative for 1 year and students who were not involved. A quantitative post hoc analysis was used to examine data collected from the state assessment database using a convenience sample of only 6th grade students ($n = 109$). The students' data on the statewide test revealed a mean difference between the 1:1 group ($n = 57$) which scored 13 points higher than the control group ($n = 52$). Results of an independent t test were statistically significant at the $p = 0.062$ level. A position paper based on study findings includes recommendations to the local board of education to continue the initiative and plan professional development for teachers. Further research should be conducted to evaluate the effectiveness of the initiative. Investments in technology such as this initiative may result in improved teaching and learning as a positive social change outcome. Being involved in a 1:1 laptop initiative at an early age in school may assist students in becoming literate in the use of technology, which may help them meet their future career goals.

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Section 1: The Problem

Many school personnel in the United States today are looking to incorporate cost-effective technology into educational programs that involves use of computers and other electronic devices. According to Downes and Bishop (2015), school personnel have perceived a positive effect on academic achievement from the use of laptops. Downes and Bishop found that giving students dedicated laptops to use at home improved their standardized test scores. In other studies, students who were provided dedicated laptops showed engagement, improvement, curiosity, and involvement in both autonomous and group work and also exhibited self-efficacy, problem-solving, and student work value (Islam & Gronlund, 2016). A 1:1 laptop initiative, along with other technology advances has become one such popular school reform effort because of their promise of delivering noticeable changes in schools.

One of the most commonly initiated types of technology programs is a 1:1 laptop initiative, which is typically created to teach 21st century life and career skills, such as being able to demonstrate creativity, thinking critically, collaboration, and problem-solving skills (New Jersey Department of Education, 2013). Educators at the project site, an elementary school in the U.S. state of New Jersey, implemented a laptop initiative during the 2012–2013 school year, which was similar to many other 1:1 laptop programs throughout the United States. With budgets being reduced, technology constantly changing, and costs rising for infrastructure, the school superintendent suggested that an evaluation be completed of the 1:1 laptop program to determine if it met its objectives and if the budget should continue to support the current initiative.

A disconnect regarding the use of laptops and the role of the teacher appeared to be present in the middle school where the research study occurred with student learning being presently participatory in many of real-world contexts. The transformation occurs in the participation of students throughout the world. With the participation, students can converse, design, and publish original, meaningful, and beautiful work in the classroom (Richardson, 2013). While circulating through my school, I observed similar findings to Richardson's (2013). Although the laptops had been purchased to improve academic achievement, many students used them in an unofficial capacity such as gaming and or messaging friends. Based on the information I obtained from informal observations and a review of students' login history on their laptops, I concluded that the students used their laptops for noneducational purposes. These noneducational uses of the laptops had the potential to negatively impact student learning because students were spending more time on unofficial, noninstructional use than their assignments related to the instructional curriculum. At the time of this project study, the efficacy of the school's laptop initiative had not been evaluated to determine if it has met the designated goals of improving student learning while staying in a cost-effective budget. Thus, the superintendent agreed to allow a program evaluation to be completed.

The Local Problem

A program evaluation of the 1:1 laptop initiative in this school was appropriate because the district was expending a significant percentage of funds from the school budget on this initiative. Before district administrators spent additional resources to expand and continue the laptop initiative, it was necessary to assess whether the initiative

had met the designated goals of improving student learning while staying in a cost-effective budget. With budgets being reduced, technology constantly changing, and costs rising for infrastructure, a research evaluation could help to determine the extent to which the designated milestones had been met and if the budget should continue to support the program.

Increasing the benefits of student learning through the use of technology continues to be the benchmark used by society. In a study conducted by Gundy and Berger (2013), many teachers said that they learned from their pupils as they integrated devices in the classroom and that students' increased interest, motivation, and learning reinforced their desire to integrate devices in their teaching practice. Other teachers in the study said they had been inspired to continue using technology as their approach to teaching was compatible with the integration of laptops. According to Gundy and Berger, there is no going back once a school has introduced a laptop program. The latest mobile devices are redefining 1:1 programs as laptops are being replaced with hand-held devices (Baran, 2014). In the study location, every student and teacher was given a laptop computer. Each individual who participated in the initiative carried the device to and from school. All parties were able to access digital content, such as online textbooks. Students were able to research materials to complete projects through their devices. They submitted papers and projects online via teacher-created dropboxes. New mobile technologies such as these provide an enhanced personalized learning experience for students, according to Gundy and Berger. School district leaders who consider the introduction of a 1:1 laptop initiative could find the data collected in this study useful for

determining the technology's effect on various educational environments within a school.

Rationale

In this school, the established objectives for the 1:1 laptop initiative, approved by the board of education, were to integrate technology into the curriculum, to produce a fundamental change to student-centered learning, and to empower students with the skills necessary to think critically. No one had evaluated the level of efficacy of this initiative to determine if it was meeting its objectives. In conducting this project study, I folded the board's objectives into a single evaluation approach. My specific purpose was to compare two classes at the school (the last one not under the 1:1 initiative to the first class under the 1:1 initiative) to see if there was a difference in statewide math composite test scores based on participation in the initiative.

Definition of Terms

1:1 programs: A digital environment based on the use of a device, such as personal laptop computer), in which all students are given a device. In educational settings 1:1 programs refer to “learning environments in which all students have access to a variety of digital devices and services, whenever and wherever they need them” (Blau, Peled, & Nusan, 2016, p. 1223).

First-order change: The next most obvious step to take when evaluating a program (Marzano, Waters, & McNulty, 2005). The incremental change will fine-tune the program incrementally.

Mobile devices: Technologies that are mobile. They include cell phones and smartphones and may include other devices like tablets, laptops, and netbooks (Gikas &

Grant, 2013).

Personalized learning: Any experience that is self-initiated and directed toward goals which aid students in being involved in self-reflection for learning and personal growth (Kong & Song, 2015).

Second-order change: A type of change that produces a change from what is expected, both in framing a problem and discovering a solution (Marzano et al., 2005). If appropriate, this change produces a change in direction and requires new methods of thinking and acting.

Summative evaluation: An evaluation with the focus on the outcome of the program (Cummings, Stoolmiller, Baker, Fien, & Kame'enui, 2015).

Significance of the Study

I sought to determine if the use of the 1:1 laptops met the district's objectives established at the onset of the program. , The superintendent of schools and the academic committee of the board of education wished to determine if after several years this program is meeting its objectives. In analyzing the outcomes of another laptop program, Katz, Felix, and Gubernick (2014) concluded that students involved in the program earned significantly higher test scores and grades in English language arts, writing, and mathematics.

The local board of education established and approved the 1:1 laptop initiative to integrate technology into the curriculum, produce a fundamental change to student centered learning, and empower students with the skills necessary to think critically. I tried to determine the differences in math standardized achievement test scores between

those students who participated and those who did not participate in the initiative. I expected the data to show a significant difference and positive increase for those students who were exposed to the laptop program over a 1-year period.

The results of this study's findings may engender social change related to the use of technology in schools. Integrating technology into the curriculum may foster more student-centered learning. I conducted this project study to determine if the initiative was meeting administrators' objectives for it.

Research Question and Hypotheses

The purpose of this study was to examine the implementation of a 1:1 laptop initiative for student learning and follow up the results with a project in the form of a summative evaluation report contained within a position paper (see appendix). The results will be shared with the academic committee of the local board of education. The results may enable leaders of the school district to modify, maintain, or eliminate the current 1:1 program. The current 1:1 initiative consumes a significant portion of the school's budget while also encompassing a large portion of the professional development and assessment used by the teachers. The local school based annual goals on topics associated with the 1:1 laptop initiative. The board of education can recommend a change to or elimination of the program if the results of the evaluation do not sufficiently support its costs or benefits.

The results may provide stakeholders with information to support social change related to the use of technology in schools. The social change of incorporating laptops into the education of students could have an impact on the overall landscape of student

learning (Cottone, 2013). However, the success of 1:1 laptop initiatives and their increasing popularity also run the risk of incorrect implementation of the program leading to no noticeable gains in student learning. Using the technique of a summative-based program evaluation of the 1:1 laptop initiative, I sought to determine if the objectives of the initiative had been met and whether the following research question was answered: What is the difference in the New Jersey Assessment of Skills and Knowledge (NJASK) math composite scores between sixth grade students who were in school before the implementation of the 1:1 laptop initiative and sixth grade students who were in school after participating in laptop initiative?

The null hypothesis of the study was that the implementation of a 1:1 laptop initiative would not increase student assessment scores and thus not improve student learning. The alternate hypothesis of this study was that the implementation of a 1:1 laptop initiative would increase student assessment scores thus improving student learning. The independent variable was participation in the 1:1 laptop initiative in sixth grade, and the dependent variable was the NJASK math composite score from the school year tested. One group of students took the NJASK prior to implementation of the initiative and a different group took the NJASK after implementation in the sixth grade. Once the math composite score means were calculated, the difference between the math composite score means by group was determined by using an independent *t* test.

Review of the Literature

School personnel throughout the United States are implementing technology programs consisting of the use of various types of devices. One type of technology

program is a 1:1 laptop initiative: one laptop for one student. The literature review consists of a variety of sources with information on the study topic. I followed a systematic approach to collect full-text materials found in professional peer-reviewed publications. Proquest Central was the database used to search the key terms *1:1 laptops in schools* as well as *technology in schools* along with *conceptual framework* and *program evaluations*. Many sources were obtained from online publications while others were obtained from networked databases that I accessed via collegiate libraries (Walden University, Georgian Court University, and Monmouth University), I also reviewed nonelectronic texts and previously published dissertations.

Conceptual Framework

The conceptual framework for this study came from Stufflebeam's (CIPP) program evaluation model. I selected this model to study and document the target program's ongoing objectives. The CIPP model links evaluation with program decision-making and ultimately the program's value (Mazur, 2013). The evaluation of the research question on the difference in the NJASK math composite scores between sixth-grade students before the implementation of the 1:1 laptop initiative and sixth-grade students after the laptop initiative implementation determined the 1:1 initiative's value to the school. Using the CIPP model, decision makers can choose whether the program should be maintained, changed, or dropped altogether. In a formative way, use of the CIPP model helped administrators to shape improvements while the project was in process. Evaluation findings within the CIPP model control and strengthen activities and program design and to report on the progress of the program to the budgetary sponsor, policy

directors, and community members (Stufflebeam, 2010). This particular model, CIPP, was engaged to supply documentation needed to identify and confirm the range of scores on state assessments from pre-initiative to post initiative. The compiled scores, and data analysis along with the CIPP checklist information determined the differences in NJASK math composite scores of students.

I used the terms *1:1 laptops in schools*, *technology in schools*, and *laptops in education* in my database searches to obtain background information and relevant results from other research studies. The information I gathered from other research studies was on students' learning, the use of laptops as an instructional tool, technology in the classroom, technology immersion, teacher professional development on how to incorporate 1:1 programs, and the effect of a 1:1 initiative on pedagogy. Researchers have found evidence showing that 1:1 computing is a technological educational tool where access to technology can be shared and where teachers and students have access to devices like laptop computers (Stanhope & Corn, 2014). The literature shows technology in schools is used throughout the United States in many different formats.

Student Learning

Observing and participating in programs that are engaging today's students supplies the teacher with insights about teenagers and their likes and dislikes. Blau et al. (2016) noted the prevalence of the daily use of technology in the classroom has moved students toward more being visual learners. Not all students respond to older teaching techniques that focus on teachers' lecturing and the use of textbooks while in their study, Downes and Bishop (2015) found that students who used computers in schools to

write were not only more interested and stimulated in their writing, but also produced work that was longer and of a higher quality, especially at the secondary level. The incorporation of computers within schools meets the current interests of students and thus students use technology frequently.

Redmond and Maya (2014) noted that a majority of teachers in the United States said digital tools encouraged students to be more personable in their writing by encouraging expression and providing a global audience for their work. Researchers have found that digital technologies are changing the way students write in myriad ways and have also assisted teachers, particularly of middle and high school students. Despite some difficulties, 50% of these teachers (across all subjects) noted that the Internet and other technological tools make it easier for them to teach writing. Professional staff in schools are experiencing a shift in lesson planning through the use of technology.

An area considered by educational leaders during the 1:1 laptop initiative was the importance of being cognizant that students' use of the laptops in school and for homework was not a teacher expectation, because many students did not see the laptop as a tool that added to the learning experience (Cyr, Berman, & Smith, 2015). Cyr, Berman, & Smith, found that when provided with laptops, students and teachers experienced changes in their teaching and learning practices. Having access to laptops offers more choices and an assortment of tools and resources (Warschauer, Zheng, Niiya, Cotten, & Farkas, 2014). In addition, analyses of outcomes measured after participation in the laptop program indicated that students who did participate earned significantly higher grades in English-language arts and mathematics and had better overall grade point

averages (Towndrow & Vallance, 2013). Peterson-Karlan (2015) indicated that giving students dedicated laptops increased their educational achievement as measured by standardized composite test scores.

Researchers have shown that access to 1:1 computing leads to quantifiable changes in teacher methods, achievement, engagement, and ability to conduct research. Rosen and Beck-Hill (2012) found that the incorporation of a 1:1 program significantly improved academic achievement, reduced students' unexcused absences, and reduced the number of student disciplinary infractions. In a 1:1 initiative study by Islam and Gronlund (2016), students showed greater engagement, interest, and contribution in both autonomous and community-oriented work, and detailed enhancements in critical thinking, student self-efficacy, and student work value. As Downes and Bishop (2015) found, the impact of K-12 1:1 computing access refers to teachers' pedagogy and, using technology has caused teachers to become more constructivist in nature.

Each of these studies was conducted in similar settings to the school for this program study. The middle school age students participated along with their teachers in these studies. The number of students in each study was comparable to the number of students who were eligible to participate in this program evaluation. As technology integration becomes mandated in schools, the impact of 1:1 initiatives become critical to the implementation of programs.

The Use of Laptops as an Instructional Tool

The use of technology in the classroom can improve in learning when incorporated into the curriculum in a relevant manner (Aragon, Aldoubi, Kaminski,

Anderson, & Isaacs, 2014). Richardson et al. (2013) found that curricula might be transformed so that it contains material that is reflective of the quick technological world that the students currently live in.

Schroeder and Adesope (2015) noted that how one thinks about measuring the data related to resources, conditions, and results of student learning, that close attention to the use of technology, both in the classroom and at home, is urgently needed. They noted that teachers have custom-designed educational activities to help students best use the new technologies. Their study also demonstrated that the manner in which educators use a tool has an effect on the learner's engagement and learning. When teachers actively incorporated technology at the beginning of an activity or project, the students showed higher test scores and were more engaged.

As Katz et al. (2014) recognized, a more progressive view that technology can affect achievement, including updating the overall efficacy of education. Grant et al. (2015) showed that nearly 95% of adolescents are online. Grant et al. noted that methods of teens' Internet use have changed from being wired to desktops in the home to the use of devices connections that travel with them throughout the day. About 3 in 4 teens ages 12-17 are mobile Internet users who noted they at least occasionally use, tablets, and other devices, such as cell phones, to access the Internet (Grant et al.).

Educational administrators find laptop programs alluring when seeking new methods to promote the kinds of creative thinking and learning needed in the 21st century. Studies suggest that laptops may have a limited effect on increasing student achievement; however, they have been effective in the areas of language arts, particularly

that of analysis and writing strategies (Downes & Bishop, 2015). Having available laptops gives teachers the capacity to offer their students projects that are both challenging and motivating. Arguably, technology has been shown to have the greatest impact on teacher- and student-created projects in a school district (Keppler, Weiler, & Maas, 2014).

Tallvid (2016) suggested that faculty who do not integrate laptops into their coursework should consider ways to limit or control their use by the students, or at least inform students about the pitfalls laptops pose to themselves and other students in their vicinity. Keppler et al. (2014) highlighted that students not only were eager to use their laptops daily in each class for increased access not only to educational websites, but also used to access digital resources and games, assist with homework, and offer more opportunities to interact with their fellow students through group activities, collaborative lessons, and research projects.

If schools are committed to a 1:1 laptop initiative, especially when they allow students access to laptops in and out of school, the changes of raising academic achievement are increased (Martin & Carr, 2015). One of the areas to be cognizant of, when implementing a 1:1 initiative, is to make sure the initiative is not just another effort to improve instruction. Most efforts to improve achievement fail to effect teaching, learning across schools, districts, and states. Toh (2016) noted that the 1:1 laptop computer initiatives, when implemented after concerns for district policies, cost issues and far-reaching placements, have gone further than most other efforts. Islam and Gronlund (2016) attributed the development of better communication, collaboration and a

more supportive school environment to the 1:1 initiative.

A crucial advantage of a 1:1 laptop program is that it allows all students to work on technology-based research assignments and projects at home with their school-issued laptop (Warschauer & Newhart, 2016). Having this access thus helps extend the learning time for all beyond the school week, a major goal for educational improvement.

Technology in the Classroom

Tallvid (2016) reported that middle school teachers found substantial benefits from the use of a technology program. Teachers indicated technology has helped them instruct more, in shorter time, and with greater depth while their students learned more and with greater detail and understanding. The technology of today, whether it is the Internet, social networking sites, or the newest device, provides students a unique opportunity to harness an understanding of the power of the information through the use of technology education (Philip & Garcia, 2013). With the onset of the newest technologies, such as mobile devices which can easily access social networking sites, the need for inspiring students through education, assuring they have technological literacy, is of critical importance (Soukup, 2014).

According to Warschauer et al. (2014), an important change is already occurring in education; it is the examination of the process versus the product. This must occur if the potential of access to laptops in schools, as much in learning as in pedagogy, is to be maximized. The use of laptops allows students to have greater control of their own. Teachers have realized they need not be in total control of the classroom (Blau et al., 2016). In a study by Annan-Coultas (2012), students indicated that because faculty

members knew that students had unlimited access to materials instruction would be more flexible. In particular, faculty members incorporated different types of resources knowing students could access them.

In the view of Toh, (2016) laptops are not simply technological tools; instead, they are tools to improve cognition which can be incorporated into the lessons and daily educational objectives. The evidence indicates many teachers have reached the crossroads in the utilization and integration of the laptop into their teaching. According to Towndrow and Vallance (2013), initiatives are most effective if they are focused, such as the cases where all students are given laptops which they can take home. Students need to have continuous, focused interaction with the use of the laptops. Students were able to engage in learning during and after school, by being able to use that tool (Land & Zimmerman, 2015).

Warschauer et al.'s (2014) concluded that in terms of presentation, laptops enabled students to produce work of higher quality. Annan-Coultas (2012) found that the way that students use their laptops has also influenced how their instructors use technology. In some cases, the way in which students wanted to use their laptops for note-taking has influenced the faculty to post lectures prior to class sessions. Laptop access enables the use of the Internet, which may show an improvement in students' learning (Annan-Coultas, 2012).

The impact on student learning with a 1:1 laptop program in itself is unlikely to make a deficient school into a successful school (Dennen, 2015). Stanhope and Corn (2014) have reported that in studies they researched, 1:1 laptops initiatives depend mainly

on teachers for success. Stanhope and Corn were not surprised to find that teacher professional development was important for successful implementation. Sundeen and Sundeen (2013) stated that if student achievement was the primary goal, a 1:1 laptop program has a better chance of being correctly implemented. While long-term indicators of success still need to be evaluated, previous studies have suggested that 1:1 learning experiences prepare students for postsecondary experiences in a globally connected, technologically-integrated and supported world (Stanhope & Corn, 2014). Technology within the classroom has enabled students and teachers to broaden the depth of content in both teaching and learning.

Technology Immersion

Since 2006, the percentage of teenagers who are online daily has remained steady (Grant et al., 2015). Yet, the nature of teenagers' Web use has transformed dramatically during the time when immobile connections linked to desktops in the home had to physically connect to modems or telephones. Both Islam and Gronlund (2016), as well as Gikas and Grant (2013), showed data that teachers noted improved interaction, between themselves and other faculty members, students, parents, as well between students. The teachers indicated that their students showed improved commitment, desire, and involvement in both collaborative and independent work, and reported refinement in student's solving problems, self-efficacy, and regard of their work.

To take advantage of using computer immersion productively, Hatakka, Andersson, and Gronlund (2013) suggested schools still need quality administrators, well-prepared teachers, and an effective curriculum that leads to a successful school.

Technology immersion reinforced their view for opportunities that challenged and motivated students to learn in school, inspired them to be independent learners, and helped them be prepared them for careers after school.

School district leaders who supported technology infusion noted that students who used laptops showed more growth than only improving their standardized test scores (Martin & Carr, 2015). They noted increases student behavior, reduced teacher workload, better communications with students. They also noted more professional development to was offered to assist with technology integration (Annan-Coultas, 2012). Have this access allowed students to better understand other cultures, increased their opportunities to learn outside of school, and moved them from drill and practice for tests and toward product creation. The most successful in achieving positive outcomes for laptop programs for students have clear and well-planned learning and language arts objectives; they are educational immersion programs involving laptops, rather than technology programs per se (Towndrow & Vallance, 2013).

The foundation for improving student performance within a 21st century classroom environment appears to be each student and teacher having a laptop computer (Cottone, 2013). Cottone (2013) concluded that when computers are used for instruction, students' attitudes and self-concept toward learning improved consistently. The combination of different practices with the use of a laptop allowed learning at home and at school with different learning intentions being merged into more interrelated learning scenarios. Whether via laptop initiatives or other instructional interventions, school leaders need to move away from a dated focus on teaching the basics to a more

contemporary approach that emphasizes both basic educational content and 21st-century skills, with the latter including the creative thinking and complex communication which use technology (Towndrow & Vallance, 2013). The authors noted that 1:1 laptop programs let learners and educators the chance to experience out-of-the-school activities during the school day. While outside the school, students have the opportunity to watch videos or browse through and utilize with a multitude of learning contents.

Data from Islam and Gronlund (2016) showed that students were able to better communication and support each other in school as a result of the 1:1 initiative. Tallvid (2016) mentioned that certified staff perceived the 1:1 laptop initiative as having a powerful impact on the increases in their academic achievement. The data from Smith's 2012 study suggested the use of 1:1 laptops had been the most significant initiative implemented since standardized test scores were analyzed.

As students developed expertise with the technology, they are able more independent learners. Ke (2016) discussed digital natives in academic circles and the fact that students today are better consumers of technology, particularly in the use of devices, such as smart phones and games consoles. Ke (2016) noted that digital literacy is lifelong and should be taught well in an increasing technological in a connected international society.

Teacher Professional Development and 1:1 Programs

To successfully increase the use of a laptop, teachers must constantly pursue opportunities in professional development involving technologies and be willing to make mistakes when first utilizing new technology in the classroom (Yuan-Hsuan, Waxman,

Wu, Michko, & Lin, 2013). Administrators who are continually involved in organizing professional development can focus that development on areas that stress utilizing the same technology that students use. When teachers and administrators self-reflect on the educational appropriateness of the laptop, students better understand how they should use the technology (Baran, 2014). Downes and Bishop (2015) suggested that technology integration into teaching and learning is not a unique phenomenon and in fact teacher training should be designed to meet to the specific context of learning and intended learning outcomes. Proposing that teachers being introduced to technology exclusive of a specific teaching context will result in an emphasis on tools and not on using technology for teaching the content of the academic area. It is only since the early 2000s that 1:1 teacher education programs began to be recognized in the literature, so, although there are personal opinions and cognizance of the advantages and disadvantages, the data on this is limited (Downes & Bishop, 2015).

The administrative leaders in a 1:1 laptop initiative look to support and encourage the teaching staff to broaden their views on the use of this form of technology in the classroom. According to Project RED, a national research consortium, a forward-action plan to investigate the ways technology can help redesign our education system must be developed by school leaders which incorporates insights and skills related to first- and second order change so that a 1:1 technology environment can create a teaching and learning environment that is reproducible. Together with the recent emphasis on technology integration, it is imperative to examine how alternative approaches to technology integration in teacher education affect the skills and dispositions of teacher

use of technology (Downes & Bishop, 2015).

Teachers today find themselves charged with the added challenge of investigating the latest emerging innovations to extend student learning. Despite being content with school support and resources, 85% of teachers seek out their own options to learn more about incorporating digital tools into the learning process (Redmond & Maya, 2014). When a new form of technology is integrated in education, teachers need to make the determination whether the technology is helpful in advancing the educational goals of the students (Kay & Lauricella, 2016). In this study, teachers reported that not only did the establishment of laptop programs allow them to use a more constructivist framework, but it also gave students more control of their own education; they actually felt more in control.

The Effect of a 1:1 Initiative on Pedagogy

The cost of technology has become more affordable for many schools, which has led to 1:1 initiatives opening many opportunities for both teaching and learning. The acquisition of 21st-century skills, such as the creative, critical thinking, collaboration, and problem solving is as much a part of the education today as the learning of the content. Stanhope and Corn (2014) mentioned that teachers struggled to teach baseline content with unfiltered information and primary sources that were almost impossible to access for the common classroom with no wireless capability prior to the 1:1 initiative.

Teachers became more comfortable with the technology and began to realize some of the unique advantages of both increased access and having the technology in the classroom; they came to perceive technology differently (Baran, 2014). Because of the

current generation of students' familiarity with technology and their ability to understand the benefits of it, technology integration into the classroom is in the best interest of students and teachers (Baran, 2014). Instructional technology has already been incorporated into curricula throughout the country, and when properly incorporated in makes teaching more appealing as well as provide educational benefits to students. Results suggest that in a globally connected world, a 1:1 learning environment better prepares students for their future (Blau et al., 2016).

The above examples from the literature show that the 1:1 laptop initiative can be implemented and successful and evaluated in order to determine if it is meeting the objectives originally established. A review of program evaluations enabled this researcher to select an appropriate evaluation system.

Program Evaluation Models

I used a program evaluation model to study the impact of the 1:1 laptop initiative. Administrative leaders gain valuable knowledge about their programs and have data to demonstrate accountability with program development through the use of a strong program evaluation (Frye & Hemmer, 2012). The data obtained from program evaluations can give researchers information on the students' experiences with laptop computers as well as how the laptops might have changed their educational experiences since their implementation.

Educational programs are essentially about change; therefore, to determine whether change has occurred one can design a program evaluation (Frye & Hemmer, 2012). Through the data collected, the research assisted the process of evaluating the

school's 1:1 laptop initiative by testing for a significant difference in test scores.

The program evaluation model I used for this study was Stufflebeam's (CIPP) model. The model consists of four complementary sets of evaluations that take into account important, but often overlooked, program dimensions (Jeon & Lee, 2014). As Frye and Hemmer (2012) stated, a CIPP context evaluation study can identify, as well as assess, materials, opportunities, needs, and problems, which are integral to any program in order to define that program's goals and priorities.

The 1:1 initiative is suited for an evaluation using the process portion of the CIPP model because that portion of the model is aligned with systems theory and complexity theory. Systems theory focuses on the arrangement of and the relations between students who use laptops, which connect them into the whole or the overall 1:1 laptop initiative. Complexity theory has specific traits that are shared by most complex systems (Koopmans, 2014). In this system, the 1:1 laptop initiative is the combination of many students who are using laptops simultaneously thus, behaving as a single unit. These students responded to their environment during a lesson involved with laptops. AbdiShahshahani, Ehsanpourb, Yamanic, Kohand, and Hamidfare (2015) noted CIPP is sufficiently adaptable to drive program change and in addition produce summative investigations of a program's results. This program evaluation assisted the researcher to uncover areas of improvement.

Implications

This program evaluation was used to help determine if the current 1:1 program showed an increase in student-test scores when compared to those of students not

exposed to the program. The academic committee of the local board of education will be privy to the results of this study. The results will enable school district personnel to modify, maintain, or eliminate the current 1:1 program. The current 1:1 initiative consumes a significant portion of the schools' budgets while also encompassing a large percentage of the teachers' pedagogy. If the results of the program evaluation do not support the cost or benefits of the program, the board of education has the option to recommend a change to the 1:1 initiative or the elimination of the program. The results may provide potential social change of technology in schools by determining if a 1:1 laptop initiative or other uses of personal devices could benefit student learning not only in this particular school, but also to other 1:1 laptop initiatives elsewhere. The social change of incorporating laptops into the education of students could have an impact on the landscape of student learning.

Summary

The research described in the above literature review indicated that 1:1 laptop initiatives have affected both teaching and learning. The research found that students in schools that have implemented 1:1 initiatives outperform those in other schools. Though some studies have shown that these initiatives are not productive and that schools are abandoning programs, the majority of the literature shows many more are successful and continuing with their 1:1 initiative. I deemed the study of the 1:1 laptop initiative critical in order to offer the students the best program possible. With the district continuing to invest school funding in the initiative, the superintendent of schools and the academic committee of the board of education wished to determine if after several years this

program is meeting its objectives. When I approached the superintendent of schools and the committee about completing a program evaluation as a project study, they were receptive and looking forward to the results of the evaluation.

A program evaluation of an existing 1:1 laptop initiative enabled this researcher to conduct a study to determine the effect of the program in its current form. Study results will be available for the district board of education to help make a determination to continue, modify, or drop its use altogether. The district academic committee will be presented with a position paper created as a deliverable summarizing the program evaluation results of the 1:1 laptop initiative investigated in the proposed study. This document can add to the information used by the board of education to make an informed decision on the current 1:1 laptop initiative.

The previous section provided a synopsis of research found in the literature related to 1:1 laptop initiative. Section 2 will discuss both the research methodology and the design applied in the study. The research conducted is mentioned along with the description of the students in more detail. The method of data analysis is discussed, along with the data collection tool and the data analysis. The chapter concludes with a discussion concerning the limitations involved in the study. Section 3 will discuss the project that was developed as a result of the data collected and Section 4 contains personal reflections and conclusions.

Section 2: The Methodology

My purpose in conducting this program evaluation was to investigate the differences in NJASK math composite test scores between students who participated and comparable students who did not participate in the laptop initiative at the school of interest. The district's board of education established and approved the 1:1 laptop initiative to integrate technology into the curriculum, to produce a fundamental change to student-centered learning, and to empower students with the necessary skills to think critically. District leaders considered an increase in test scores after exposure to the initiative to be a proxy outcome for meeting these general goals. The IRB approval number for this study is 07-20-16-0198801.

Research Design and Approach

I conducted a program evaluation using Stufflebeam's (2010) outcome model. Through its focus on decision-making, the CIPP process can serve as a guide to the collection of data to help decision makers determine if a program should be sustained, modified, or terminated (Robinson, 2002). The portion of this particular model, CIPP, was used to focus on program improvement.

The data collected were the individual de-identified math composite scale scores of the NJASK assessment maintained by the New Jersey State Department of Education. The target, archival data included the sixth-grade math spring test scores after 1 year of exposure to the treatment. The comparison group who were not exposed to the initiative included members of the sixth-grade class the year before the actual initiative was implemented. The math composite scores collected for the comparison group were also

from the state database of spring test scores.

This evaluation of the 1:1 laptop program was summative in nature. A summative evaluation focuses on the outcomes or the effectiveness of a program (Cummings et al., 2015). The overall goal of the evaluation was to determine if the 1:1 laptop initiative at the project site produced a fundamental change in student-centered learning and empowered students with the skills necessary to think critically, as reflected by the NJASK math composite score comparison.

Setting and Sample

I used a convenience sample to select student test scores for this study. All sixth-grade students from two designated time periods who sat for the spring state assessment were selected: (a) the group of sixth graders who were exposed to the 1:1 initiative for one school year ($n = 57$) and (b) a group of sixth-grade students ($n = 52$) from the same school in the year before the initiative was implemented.

Convenience sampling is an accepted method of choosing participants for a study. It is typically used for pilot studies that are time sensitive and intended to provide a preliminary indication of a program's potential effectiveness (Creswell & Plano Clark, 2018). However, convenience sampling can pose external validity threats that limit the generalizability of the study findings. Inferences to a larger population of sixth-grade students, or to elementary students in general, assume a similarity of cogent characteristics that can be assumed under random selection or tested statistically from a preselected set of critical factors, such as prior math achievement, that may be related to the dependent variable (Bornstein, Jager, & Putnick, 2013). For sample groups that are

small and are not robust to the assumption of homogeneity of variance, a less conservative confidence interval (e.g., 80% instead of 95%) can be considered (Etikan, Musa, & Alkassim, 2016; Saunders & Thornhill, 2012).

One limitation of using convenience sampling, which involves nonprobability sampling, is that many statistical analyses are underpowered and do not show statistically significant results (Tsang, Colley, & Lynd, 2009). The most commonly used criteria, in general, are probabilities of 0.05, 0.01, and 0.001. A simple method used to increase the power of a test when using a convenience sample is to use 0.10, a larger significance criterion, instead of the more commonly used 0.05 (Etikan, Musa, & Alkassim, 2016). This is a less conservative test. This change will result in a greater chance of rejecting the null hypothesis when it is false and is particularly pertinent when a sample size is small as a result of convenience sampling (Hoenig & Heisey, 2001). Convenience sampling, the most common technique is the preferred sampling technique that allows researchers to fast, inexpensive and easy access to subjects.

The setting was a K-8 school on the New Jersey shore. The superintendent of schools and the academic committee of the board of education granted me permission to access the de-identified archival data in the form of math composite scale score results. The total number of student scores selected was 109. The sample was the number of students enrolled in the sixth grade at the time of the state assessment. The demographics of the two groups of students was 85% White, 11% Hispanic, 2% Asian, and 2% Black (New Jersey Department of Education [NJDOE], 2013).

Instrumentation and Materials

Results of standardized tests were collected from the secure database maintained by the NJDOE. The superintendent of schools and the academic committee of the board of education granted permission to use the NJASK data. The math composite scale scores from the standardized assessments was used to study whether the distribution of laptops to students increased student achievement on the NJASK math composite scores in sixth grade.

The state assessment (NJASK) was field tested in May 2003 and revised in 2006. The NJDOE conducted both validity and reliability tests on these assessments. Federal law requires the NJDOE to ensure that the assessment tools used to measure student achievement provide valid and reliable results. The state also must determine whether the extent of the measurement error associated with test scores is reasonable and whether it can be considered when interpreting the scores for individual students. Reliability, using Cronbach's coefficient alpha, showed coefficients of .88-.89. Adequate representation of the domains defined in the Core Curriculum Content Standards (CCCS) was examined by the state through the use of a test blueprint. Stratified alpha was used to assess the reliability of the different items. The scores of the NJASK are available as scaled scores, raw scores, and performance levels. The test was constructed using item response theory (IRT), and performance standard levels were based on scale-score cuts. The test is administered each spring to all students in Grades 3-8. The math composite scale scores were used in this study. These scale scores had a minimum and maximum range of 100 to 300, respectively. The actual score range for the two groups was 195 to 275.

Data Collection and Analysis

RQ: What is the difference in the NJASK math composite scores between sixth-grade students who were in school before the implementation of the 1:1 laptop initiative and sixth-grade students who were in school after laptop initiative implementation?

Data was collected from the archived NJASK state database. The initiative was implemented to all students in Grade 6 for this study; thus, the comparison group (or, control group) was taken from the school's Grade 6 students in the year before the program's implementation. The treatment group was taken from a different group of the participating Grade 6 students 1 year after the implementation of the 1:1 initiative.

Descriptive statistics for the two groups are provided in Table 1.

Table 1

Group Statistics – Treatment Versus Control

Group	<i>M</i>	(<i>a</i>) <i>N</i>	<i>SD</i>	<i>SEM</i>
Treatment	236.74	57	36.78	4.87
Control	223.63	52	35.47	4.91

An independent *t* test, using a 0.1 significance level, was calculated to evaluate whether a statistically significant difference in test score means by group could be found.

Assumptions, Limitations, Scope, and Delimitations

Assumptions

I assumed that the students in the initiative used the laptops as specified over the course of the program implementation. Given the use of the posttest only research design,

several validity considerations are possible. It is assumed, therefore, that the groups remained the same demographically and academically during the school year. It is also assumed that no other major schoolwide changes in principal leadership or teacher assignments occurred during that time. In the matter of the state assessment, it is assumed that no changes were made to the assessment and its characteristics in the timeline of data collected.

Limitations

One limitation was that the students were currently enrolled students in the school where the researcher is their principal. It is also possible that different results may have been obtained in schools representing other socioeconomic levels. The findings of this study are not expected to be generalizable to a larger population. This evaluation is examining a singular initiative in a specific middle-class environment.

Another limitation is that the majority of students come from middle to upper middle-class families, with a very small percentage involved in the free or reduced lunch program. As all students in the study school were involved in the initiative, no concurrent comparison groups were available to test statistically. It is understood that other uncontrolled factors may have affected the assessment results.

The task of planning, implementing, and assessing a 1:1 laptop initiative can be complex because laptop initiatives often involve multiple sets of stakeholders and aim to meet both the needs of students and faculty members. No study of the implementation of the initiative was completed.

Scope

The study compared two groups of students involved in the 1:1 laptop initiative. I investigated their use of laptops for educational gain via the results of a state assessment.

Delimitations

This 1:1 laptop initiative was contained to this particular school and one of the only schools in the area currently using this type of initiative. Also, while the NJASK includes various measures of student performance, the dependent variable evaluated was delimited to the NJASK math composite scale score.

Protection of Participation Rights

All data gathered were from state produced assessment results, thus protecting the identity and rights of all participants. The superintendent of schools and the academic committee of the board of education granted permission to access the de-identified test score results. The level of harm was nominal due to there not being any physical event or activity participants had to complete other than the students taking the annual assessment they would take each year.

Data Analysis Results

A posttest-only research design was used to complete this study. A posttest-only design consists of administering an outcome measure to two or more groups or to a control/treatment group and a comparison of the groups is completed (Dawson & Kumar, 2014). For this study, an independent *t-test* was calculated to determine if a statistically significant difference between the average standardized test scores was present. This analysis allowed the researcher to answer the following question: Is there a statistically

significant difference in the NJASK math composite scale scores between sixth grade students who were in school before the implementation of the 1:1 laptop initiative and sixth grade students who were in school after laptop initiative implementation?

The data collection period included two different groups of students in different school years. Given the limitations of the study design brought about by using a posttest only statistical comparison and a small convenience sample, the probability level of $p < 0.1$ was used to indicate statistical significance. Two sets of test scores were analyzed from two unrelated groups of students while in the sixth grade. Each set of scores represented different exposure times to the initiative. One group of students (control) was tested before any exposure to the laptop initiative. The other group of students (treatment) was tested after being exposed to one year of the laptop initiative.

The mean difference between the two groups was statistically significantly different at the $p < 0.1$ level with the treatment group mean at 236.74, and the control group, without the laptop initiative, with a mean of 223.63. The difference of the means is 13.11 scale score points and $t = 1.889$, $df=107$, $p < 0.1$.

Summary

The data analysis result of this summative program evaluation provides stakeholders with a preliminary finding that compares Grade 6 students who are exposed to a 1:1 technology initiative with Grade 6 students who are not exposed. Given the small size of the convenience sample which can underpower the statistical analysis, a probability level of 0.1 was set to determine significance. The comparison of the group means showed a statistically significant finding with the treatment group showing 13.11

scale score points higher than the control group. The results can be used to begin a discussion on how to expand the evaluation to include a broader sample of students with more generalizable findings. These ideas are further elaborated in a position paper contained in the appendix. All members of the local school district's board of education will be presented with a report of the study in the form of a final position paper.

Section 3: The Project

Introduction

I created a position paper to show the local board of education the effectiveness of the 1:1 laptop initiative. The local 1:1 laptop initiative was established because the district was expending a significant percentage of funds from the school budget on this initiative. Before the district spent additional resources to expand and continue the laptop initiative, it had become necessary to assess whether the program had met the designated goals of improving student learning while staying in a cost-effective budget.

The results of this study were made available as a position paper report for the district board of education to evaluate the current program and make a determination regarding continuing, modifying or dropping the program. A portion of the paper would consist of a discussion of the goal as well as the rationale of the program evaluation. The position paper would also include a review of the literature and a discussion of implications for social change.

The primary function of the position paper would be to report the results of the analysis I conducted and to make recommendations pertaining to the current 1:1 laptop initiative. The position paper can be found in the appendix. The position paper is in the form of an analysis of the evaluation using student math composite scores from a state assessment. The main audience for this position paper will consist of members of the local school district board of education and school building administrators.

Rationale

The position paper highlights the main points of the study and is an appropriate

way, I believe, for summarizing the findings of the program evaluation. The particulars of the findings would be presented in a clear and concise manner. The overall results of this program evaluation would be provided to the local school district board of education and school building administrators and made available to any other stakeholder through the board of education. A position paper would be the most logical method of reaching many stakeholders simultaneously. The board of education can use the information in the position paper as a guideline for revisions, adjustments, or changes where necessary to the existing 1:1 laptop initiative.

Review of the Literature

This literature review considered aspects of the construction of the project. First, I will provide an overview of program evaluations and explain why I selected a particular type of program evaluation for the project. Second, I will present research on 1:1 laptop initiatives and consider the ramifications of these initiatives on student achievement and learning as they relate to the initiative researched in this study. Finally, I will review the construction of a position paper and grey literature and discuss why a position paper was an appropriate method of reporting the results of this study.

As with the first literature review, I used a variety of sources to review the information. A systematic approach was conducted to collect full-text materials found in professional peer-reviewed sources. ProQuest Central was the database used to search the key terms *1:1 laptops in schools* as well as *technology in schools* along with *grey literature* and *program evaluations*. Many sources were from online publications, networked in collegiate libraries, hard-copied texts, and previous dissertations.

White Paper and Grey Literature

Grey literature is a term that refers to information that has not been published in journals, periodicals, or books (Shepley, Arch, & Song, 2014). The information may be original work that may be in the form of dissertations, research from university faculty, presentations or papers presented at conferences, or white papers (Gage, Cook, & Reichow, 2017). Authors completing program evaluations frequently rely on grey literature for up-to-date methods of data collection. In addition, staff of schools and government agencies regularly use grey literature to make informed decisions on best practices (Gage et al., 2017).

White papers or position papers are forms of grey literature which combine original research with a more in-depth description of information worded to be understood by non-research individuals (Gage et al., 2017). Haddaway, Collins, Coughlin, and Kirk (2015) indicated that a white paper from a program evaluation could be critical in making sure the results are distributed widely and that stakeholders, policy makers, and other readers view the results as useful and understandable, . The white paper allows for information to be presented soon after completion of an evaluation instead of having to wait for publication in a journal, periodical, or book (Antunez, Toevs, & Gains, 2014). The white paper also allows for the flexibility needed for each type of stakeholder to make sure the findings are explained in methods consistent with a variety of readers (Hartling et al., , 2017). The white paper allows a researcher to disseminate the findings in a concise manner.

To generate backing of an issue, a position paper can be used to describe one's stance on an issue and the rationale for that position while using facts to support a solid foundation for an argument. This project, which is in the form of a position paper, includes evidence (e.g., statistical findings and specific dates) to support the use of such a position. Peer-reviewed sources should validate the writer's position and be provided to examine the strengths and weaknesses of the position (Shepley et al., 2014). Last, in the position paper, I will evaluate solutions and suggest possible courses of action.

Evaluation Models

Stakeholders can use evaluations to determine if a program is achieving its goals and also to help programs reach their goals. A small part of my presentation to the board of education would focus on the type of evaluation model selected for this study. When used appropriately, program evaluations can be a powerful tool to address problems found within a program and can help sustain a successful program. Jeon and Lee (2014) contended that program evaluations provide a systematic way to determine what needs to be improved or changed and help to validate the practices of the program to the program stakeholders and to outsiders observing the program. Staff conducting program evaluations use the collected data to draw conclusions about the value of the program (Rogers, 2014). Evaluators should share their conclusions to allow the stakeholders to make changes to the program (Rogers, 2014). A program evaluation incorporates all stakeholders to conclude if the program is meeting its objectives.

There are multiple models to choose from when conducting a program evaluation and consideration must be taken to ensure the correct model is chosen to achieve accurate

results. According to Heafner and Fitchett (2015), the developmental evaluation requires the evaluator to work closely with the participants, goals and outcomes emerge as the evaluation is on-going, and is used to support the growth and enact change in the program where needed.

To provide timely information in a systematic way for decision making the CIPP evaluation model was originally developed (Cooper, Booth, Britten, & Garside, 2017). Because the program evaluation is serving to make a decision, it is important to know what decisions are to be served. According to the CIPP Model, context, input, process, and product evaluation are based on four kinds of decisions: planning, structuring, implementing and recycling (Cooper et al., 2017). A comprehensive structure for conducting a program evaluation of, projects, institutions and systems is performed by the CIPP model (Dawson & Kumar, 2014). This program evaluation of the implementation of a 1:1 laptop initiative focused on the process.

A strength of the CIPP model for program evaluations is that it is a handy and straightforward way to help those who are conducting the evaluation examine various forms of local data and then develop questions for further investigation (Dawson & Kumar, 2014). Evaluators can generate many questions for each of the four components of the CIPP model. Stufflebeam (1971) emphasized that both before and during the program, the CIPP model not only allows evaluators to intercede in the evaluation process when needed, but also gives the possibility of using any one of the four components.

Process evaluation identifies information about the strengths and weaknesses of a program so that the implementation might be strengthened. Process evaluation objectives include detailing the process and providing feedback. The objectives are to show the degree to which any planned activities are carried out, whether it is vital to revise a current structure, and to assess the amount to which participants agree to take on and carry out their roles. In summary, Tabrizi and Farahsa (2015) believed that for continuous improvement this method of program evaluation can help guide assessment and planning, analyze the process of implementation, and provide feedback and an action for any future of a given project.

The product portion of the model is for determining whether the objectives were achieved and whether the program should remain constant, be modified or eliminated. Product evaluation can serve three important purposes, provide summative information to judge the benefits and effects of the undertaking, and give developmental data used to make any suggested modifications. Such data may help plan for any change for future implementation. CIPP components provide the evaluator to examine the nature of most educational programs in an attempt to create ongoing program improvement (Frye & Hemmer, 2012). Decisions on the assessment of interventions and programmatic initiatives helps an organization see where they are most liable (Carman, 2013). It allows those in leadership to share the details of a program. Reports generated may assist stakeholders to make any changes that are needed (Danseco, 2013). This helps organizations maintain an organized method of monitoring their initiatives.

Technology and 1:1 Programs in Schools

The position paper highlighted the data and results from the 1:1 laptop initiative conducted in the school where this study took place. Technology, via a 1:1 program was created in this school to improve student learning. New demands and new opportunities are placed on teachers when introducing 1:1 computing in a school. Although the curricular objectives may not change, the technology allowed teachers to utilize innovative and motivating instructional approaches. Möller (2015) noted the use of computers to foster critical inquiry was more common in communities where the population had a higher income and rarely used where the population had a lower socioeconomic base.

Introducing 1:1 computing to a school or district has the possibility of improving the school climate. The impact that such devices may have on the way that teacher communicate with their students and those students' parents is a key aspect of change in school climate. Spies-Shapiro and Margolin (2014) reported student-to-student relationships were aided by computers increased significantly.

Since the year 2000, one has seen a new global tendency of implementing 1:1 technology in Israeli schools. In those schools, laptops were provided to thousands of teachers and students (Blau et al., 2016). Previous studies showed that 1:1 models improved the learning process and outcomes. When laptops are issued dynamic learning takes place that promotes student motivation and improves both mathematics and language arts achievement (Spanos & Sofos, 2015). The development of critical thinking and inquiry skills of students are by-products of a 1:1 learning model (Downes & Bishop,

2015; Tallvid, 2016) and allows for more differentiated instruction and learning (Martin & Carr, 2015).

However, the literature also noted that it is the manner in which teachers encouraged the use of laptops or other devices by students that impacts the 1:1 model significantly. Recommendations presented to the board of education via the position paper would focus on the impact of the local 1:1 laptop initiative. Teachers need to maintain their knowledge regarding technology and the best way to incorporate it in the classroom.

Technology availability in the 1:1 classrooms, does not assure teachers will be prepared to use or teach with it. (Blau et al., 2016). Teachers must have the confidence to use technology in effective ways for instruction. Teachers will have a better chance of showing effective integration of technology if they are supported by their school principals or supervisors (Blau et al., 2016). Incorporating laptops into the education of students could have an impact on student learning which is critical to social change. The evaluation of the program data gives information on Grade 6 students' assessment results.

Project Description

The results of the evaluation will be presented to the academic committee of the local school board and administration through a white paper report, also called a position paper (see appendix). The school district will support the publishing of the report by allowing this researcher to use district materials and machines to print, copy and bind the report for presentation. The district academic committee will place the topic of the presentation of the report on the agenda for a future meeting. During the meeting, a

projector will be made available to show any related details of the report requested by the academic committee. Additionally, the researcher will request permission to make the evaluation results available to the faculty and staff at a future faculty meeting.

Potential Barriers

A potential barrier to presenting the project results would be the academic committee of the local school board or administration changing and thus denying my request to present the position paper at a future board of education meeting or to the faculty at a future faculty meeting. Should this barrier present itself, I will stress the importance of the information contained within the position paper and request reasons why they do not want to hear the presentation so that I can address and ease any concerns discussed.

Timetable and Roles and Responsibilities

The presentation will occur at the next available board of education meeting and as soon as time allows. I will continue to work with members of the board of education, administration, and faculty throughout the next few months to introduce and implement areas discovered during the study to make adjustments to the current 1:1 laptop initiative.

The following timeline is based on the scheduled calendar of the local board of education.

July 2018 – Present position paper to Academic Committee of Board of Education

July 2018 – Make position paper available to community stakeholders after Board of Education acceptance

September 2018 – Update faculty and staff of results of the research at faculty

meeting.

I was the primary collector and analyzer of the data. I will have the role and sole responsibility for presenting the program evaluation to the local board of education, administration, and faculty. Finally, I will work in conjunction with all the members of the school community to assist in implementing any adjustments to continue with the 1:1 laptop initiative.

Project Evaluation Plan

A discussion with the committee at an academic meeting allows for the information in the presented position paper to be shared and discussed in order to make future recommendations to the existing 1:1 laptop initiative. The paper will contain the results of the data collected, the research question, and the original goals of the 1:1 laptop initiative, which will be discussed during the presentation to the committee members. The committee members would then share the information with the entire board of education at the next regularly scheduled meeting.

A final position paper on the program evaluation of the 1:1 laptop initiative in this school was appropriate because the district was expending a significant percentage of the school budget on its implementation over the past few years. The established objectives described in the paper, for the 1:1 laptop initiative were to integrate technology into the curriculum, to assess if it has met the designated goals of improving student learning while staying in a cost-effective budget. The results presented to the board of education through the position paper, will enable the school district to modify, maintain or eliminate the current 1:1 program. The current 1:1 initiative consumes a significant

portion of the schools' budgets while also encompassing a large percentage of the teachers' pedagogy. If the results presented in the position paper and presentation do not support the cost or benefits of the program, the board of education has the option to recommend a change to the 1:1 initiative or the elimination of the program.

The position paper and presentation to the board of education will determine if the future of the 1:1 laptop initiative has an impact on the school and community stakeholders. The school is instrumental in producing students prepared for the 21st century and needs to be willing to assist faculty members in having the appropriate tools available to meet those needs. Students and parents are an integral part of the future of the program and the board of education can use the results of the program evaluation to adjust to new technologies and the use of technology.

Project Implications

Social Change

The presentation and position paper will assist administrative leaders of the school district to periodically evaluate the implementation of laptops to ensure the programs objectives are beneficial to the curricula as well as if the program should continue to be the key component of the school's curriculum. Social change could stem from the results presented to the school board during a meeting to determine if a 1:1 laptop initiative or other uses of personal devices could benefit student learning in all grades.

Importance to Local Stakeholders

The K-8 elementary school in this study began implementing laptops as a way to

integrate technology, produce fundamental change in student centered learning, and empower students with skills necessary to think critically. A presentation of the results of a program study was used to determine the effectiveness of the initiative in this particular school. This evaluation determined to what extent the initiative has impacted student learning. Further, the recommendations mentioned in the position paper and will hopefully help create a successful and sustainable 1:1 laptop initiative in the future. Finally, the 1:1 laptop initiative will enable the local board of education to recommend a change to or elimination of the program, if desired, because of the results of the evaluation.

The social change could encourage administrative leaders as well as other groups or schools that have initiatives to learn from these findings and determine if a 1:1 laptop initiative or the use of other personal devices could benefit student learning in their school. A crucial advantage of a 1:1 laptop program is that it allows technology-based research assignments and projects to be worked on at home with their school-issued laptop. The position paper highlights having this access thus helps extend the learning time of the school week beyond the traditional time frame, a major goal for educational improvement (Schroeder & Adesope, 2015). Teaching in a learning environment with a 1:1 component helps prepare students for careers in a world which are connected via technology (Downes & Bishop, 2015).

Section 3 introduced the project, rationale, and a literature review that supports the project, as well as a project description, evaluation plan and project implications. Section 4 contains an analysis of the strengths and limitations of the project,

recommendations for alternative approaches, scholarship, project development and leadership and change, and reflection on the importance of the work. Finally, this document will conclude with an evaluation of myself as a scholar and project developer, the potential for social change as a result of this project, and an exploration of the implications, applications, and direction of future research.

Section 4: Reflections and Conclusions

The project study was a summative program evaluation of the implementation of a 1:1 laptop initiative to determine if the objectives created at the introduction of the initiative were met. Collecting quantitative data from the students currently involved in the initiative provided information on the progress of the initiative. Recommendations for continuing the 1:1 laptop initiative was based on a review of the literature and addressed best-practice actions that school leaders can pursue to create a successful and sustainable initiative. The data showed a 13-point increase in NJASK scores by the students involved in the 1:1 initiative.

In this section, I will discuss the strengths and weaknesses of the project, consider how the problem may have been addressed differently, and discuss what I learned about the process of creating a program evaluation. The section will conclude with a discussion of what I discovered about myself during the project study and the importance of the project and what was learned. I also consider the implications of the project study, its applications, and the direction for future research in this area.

Project Strengths and Limitations

In this project study, I addressed the needs for a school district to evaluate a program implemented to foster laptop use among students. While conducting a literature review on technology use in schools, researchers and other school districts and states have recognized the importance of implementing technology into the curriculum, though some studies have shown mixed results in the overall success of 1:1 laptop initiatives (Blau et al., 2016). The culminating project designed for this study provided the school

district and administrators with findings on data and recommendations, suggestions, and improvements to the 1:1 laptop initiative. Strengths of the project included the ability to create a program evaluation report that specifies findings of the study in relation to the initiative. It is also possible that different results may have been obtained in schools representing a different population. Gathering information from both students currently involved in the initiative through the use of analysis of state assessments allowed me to gather input for the study.

Recommendations for Alternative Approaches

The purpose of this project study was to determine if the 1:1 laptop initiative increased student learning. Therefore, the implementation of laptops in all instructional areas in the hopes that an increase in student and teacher use of technology in the classroom would translate into higher achievement on the state assessments. However, to date, no one had evaluated the level of efficacy of this initiative to see if it has met the goals of improving student learning. The problem could be defined as the current availability of technology within the school not being adequate to meet the needs of students in the 21st century. As the world continues to rapidly change, particularly in the area of technology advancement, the educational landscape of schools in the United States has not changed fast enough and remains traditional in many aspects of education (Martin & Carr, 2014). Alternative solutions to this problem could have required the investigation of the impact of changing many features and structures of the current system to determine if any of these could have allowed for an increase in student achievement on state assessments. For example, I could have investigated the impact of

the introduction of laptops to students and faculty through the entire K-12 school district rather than just in the middle school setting. I also could have investigated the impact of other curricular changes that may have had an impact on the results of the state assessments. Finally, I could have investigated the use of technology and the training the teachers received in order to implement the 1:1 laptop initiative. Appropriate and beneficial teacher training on new initiatives could increase student achievement in the future.

Scholarship, Project Development and Evaluation, and Leadership and Change

At the start of this doctoral process, I decided that I would complete coursework and a final project on a topic of interest that would benefit the school district. All the coursework assisted with learning aspects of conducting research and incorporating the information learned into a final study. As an experienced educator and current instructional leader in an elementary school, I was knowledgeable about the various programs within a school but had little experience on the evaluation of these programs. I understood the process of writing research papers and the importance of collecting and analyzing data. This doctoral process gave me the opportunity to sharpen my research and evaluation skills and expand them to apply to more areas within a school. I currently have the knowledge now to evaluate programs and make adjustments to the daily workings of an elementary school. I plan to continue the work started through this doctoral process and contribute to future research, presentations, grant writing, or discussions about the 1:1 laptop initiative as it continues to move forward and adapt to the continuous changes in educational technology.

This program evaluation marks the conclusion of my doctoral work, but not necessarily the conclusion of evaluating programs within my school. Completing the evaluation of the 1:1 laptop initiative has enabled me to use the knowledge and lessons learned during the process to evaluate many other types of programs currently available to the school. Leaders of other programs used by schools may benefit from similar research and analysis to make informed decisions on the success of individual programs.

The time dedicated to this program evaluation was more than expected due to many challenges that presented themselves during the process. Not only was this process completed while maintaining a full-time administrative job, but also while trying to combine life with a spouse and family. The number of interruptions created periods where not much work on the project was possible. In addition, the number of times revisions were needed to meet requirements led to rewriting many aspects of the study several times. The study was of particular interest to me as I am currently working in the building where this initiative is taking place. Even though there were times when it did not feel like progress was being accomplished, I have learned that perseverance is key to ensuring a quality product is finalized.

The final report of this study, a position paper, would allow me to present the results in an understandable manner to the local board of education. The local board of education can use the study results to determine if the 1:1 laptop initiative met its objectives and to make a determination whether the program should be continued, modified, or discontinued altogether. The use of the position paper will allow me to complete the program evaluation and present it in understandable terms and make it

relevant to the local situation. This particular evaluation focuses on one small sample of students which is unlike most other studies that are published in educational journals and are geared toward a broader population (Hartling et al, 2017).

Downes and Bishop (2015) suggested that technology integration into teaching and learning be unique with a specific context of learning and intended learning outcomes which are not a one-size-fits-all phenomenon. As the principal of the school where this laptop initiative is taking place, my ability to relate to the professional staff and give them the tools necessary to implement the initiative is paramount. As the educational leader in a 1:1 laptop initiative, I strove to support and encourage the teaching staff to broaden their views on the use of classroom technology.

My willingness to pursue this doctoral degree shows my ability to continue to learn and adjust my perspectives in many areas of education. This program evaluation highlighted my desire to use current programs and to research, evaluate, and make suggestions to broaden the program. Evidence collected during the process enabled the school to make informed decisions about the initiative and determine what works and what the students and faculty need to improve their learning and teaching.

Reflection on Importance of the Work

During the course of this project, I tried to determine to what extent the initiative has impacted student learning of a K- 8 school. Being in a position to see the use of laptops by both students and teachers on a daily basis made this project study very relevant. The collection of data was instrumental in gathering the information on the students' previous learning experiences and the use of laptops, as well as how these

laptops might have changed their learning experiences since its implementation.

This program evaluation of a 1:1 laptop initiative focused on the process and product portions of the CIPP program evaluation model. A strength of the CIPP model is that it is a useful, yet simple tool for assisting evaluators to produce questions of vital importance during the evaluation process (Jeon & Lee, 2014).

The overall lesson learned from this program evaluation is that the use of laptops in Grades 6 shows promise for enhancing the daily work habits of students. This group of students have grown accustomed to having a laptop and using the laptop to generate the majority of their classwork. The general consensus is that the 1:1 laptop initiative played an integral part to the success of the students in all areas of curricular. The initiative has also eased students' anxiety to the newly incorporated state assessments that are taken online. This assessment scenario has not been a challenge to this group of students thanks to the daily use of a laptop.

Implications, Applications, and Directions for Future Research

I have addressed the need to evaluate a 1:1 laptop initiative. It is believed by both district and school leaders that student laptops had benefits above and beyond simply raising state assessment-test scores (Sundeen & Sundeen, 2013). The results of this study will stimulate school leaders, not only at my school, but also at the local high school and other schools across the state, to affirm that implementing laptop initiatives can improve learning in schools. Improvements in the use of laptops or other devices for instructional purposes will include assistance for faculty members in addressing issues of student behavior, teacher workload, the improvement of communications with students, and

increased guidance and incentives for faculty on how best to infuse these devices into instruction (Annan-Coultas, 2012).

This project study was designed to meet the challenges of implementing an initiative to increase student learning. Although created with the intent to meet the needs of students in this one particular school the initiative can be used for students in various grade levels and schools. Future research could be conducted by evaluating similar initiatives being implemented in other schools in the district, county, state or nation. Also, due to time constraints, a delimitation for this study was the comparison of the control and treatment groups based on only one NJASK dependent measure (math composite scores). This study could be replicated to compare the groups on other dependent measures as well.

Other areas of research to support the evaluation of any educational program could use the entire CIPP model or one of the other many established program evaluations. Because the program evaluation is serving to make a decision, it is important to know what decisions are to be served. The CIPP is a comprehensive framework (which can be used as a checklist) for program evaluations for institutions and systems (Jeon & Lee, 2014). This program evaluation of the implementation of a 1:1 laptop initiative focused on the process and product evaluation.

Conclusion

The allure of laptop programs to educational administrators is they are looking to promote the kinds of creativity and thinking required in 21st-century learning. Though devices, such as laptop computers, may show only a limited effect on increasing overall

student achievement, there are particular benefits in the areas of language arts literacy, particularly writing strategies (Richardson et al., 2013). Although technology changes constantly, educational practices, can remain stagnant and resistant to change. The current educational system, although making strides towards 21st Century Learning, it is still reliant on many traditional instructional techniques. Teachers indicated technology has helped them teach more, with greater depth, taking less time, while their students learned more and with greater understanding. Today's technology, whether it is the Web, social networking sites, or the newest device, provides students an opportunity to nurture an understanding of the strength of the information through the use of technology education (Philip & Garcia, 2013). The technology available to students today in any school setting is the same technology they will use in higher educational settings, careers, and their general life activities during their lifetime.

Though some studies have shown that these initiatives are not productive and that schools are abandoning programs, the majority of the literature shows many more are successful and continuing with their 1:1 initiative. A program evaluation of the 1:1 laptop initiative enabled this researcher to propose that the program is beneficial in its current form in order to meet its objectives. The results of this study will be presented to the district board of education to evaluate the current program and make a determination if the program should be revamped in any manner. The final document, added to the information used by the board of education, can be used to make an informed decision on the current 1:1 laptop initiative.

The use of technology in the global world has these students heading into an arena

of continuing change in the use of laptops they will use on a daily basis. Being involved in a 1:1 laptop initiative at such an early age in school will evolve into these students being literate in the use of technology. The laptop initiative can be an impetus to their global success and assist them in becoming the leaders of tomorrow.

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Appendix: The Project

A Program Evaluation of the 1:1 Laptop Initiative

Introduction

This position paper provides a summary of the program evaluation performed on our 1:1 laptop initiative. A program evaluation of the 1:1 laptop initiative was appropriate because the program has been expending a significant percentage of the school budget for the past years. With budgets being reduced, technology constantly changing, and costs rising on infrastructure, an evaluation focused on the program to determine if it was meeting its objectives and also determine if the budget can continue to support the program was needed. The district was expending a significant percentage of funds from the school budget on this initiative. Before the district spends additional resources to expand and continue the laptop initiative, it had become necessary to assess if it has met the designated goals of improving student learning while staying within a cost-effective budget.

When I approached the superintendent of schools about completing a program evaluation as a project study, he was receptive and looking forward to the results of the evaluation. Currently in this initiative, 1:1 is defined as every teacher and student having a laptop. Students can access digital content, electronic textbooks, projects, and research materials through their laptop and submit assignments and projects online through digital drop boxes.

Purpose of the Study

This program evaluation was used to investigate the differences in NJASK

composite math scores between students who participated in the laptop initiative and students who did not participate in the laptop initiative. The results can enable district administrators to modify, maintain or eliminate the current 1:1 program. The current 1:1 initiative consumes a significant portion of the school's budget while also encompassing a large percentage of the pedagogy of the teachers. The board of education can recommend a change to or elimination of the program if the results of the evaluation do not demonstrate a meaningful effect size.. This evaluation of the program can be used as a preliminary finding to determine the extent to which the initiative may have impacted student learning.

Significance and Guiding Questions

I looked to determine if the use of the 1:1 laptops met our district's objectives established at the onset of the program. The problem is that funds have been allotted for the laptop initiative without any studies to ascertain effectiveness. Before the district spends additional resources to expand and continue the initiative, it is necessary to assess its effectiveness.

The local 1:1 laptop initiative was established after a suggestion from the superintendent to complete an evaluation, focused on the 1:1 laptop program to determine if it met its objectives and if the budget should continue to support the current initiative. I tried to determine the extent to which the initiative has impacted student math achievement.

Using the technique of a summative program evaluation of the 1:1 laptop initiative, I sought to examine the following question: What is the difference in the

NJASK math composite scores between sixth grade students who were in school before the implementation of the 1:1 laptop initiative and sixth grade students who were in school after laptop initiative implementation?

Student-test scores were collected on math achievement from the NJASK state assessments from 6th grade students a year before and from a different group of 6th graders after the implementation of the 1:1 laptop initiative.

An independent *t-test* was run to determine if there was a statistically significant difference in the mean composite math scale scores on the NJASK between sixth grade students prior to the laptop initiative and sixth grade students involved in the laptop initiative after 1-year.

Research Design

A program evaluation was conducted using the CIPP program evaluation model. Through its focus on decision-making, the process evaluation portion of the CIPP checklist enabled me to use the findings of this study to evaluate the 1:1 laptop initiative. The use of the CIPP process evaluation was to monitor, document, and assess the 1:1 laptop program's activities.

The purpose of an evaluation is to assist administrators and stakeholders to assess and improve the worth of this particular program so that decision makers are better able to decide if the program should be continued, modified, or dropped altogether (Strimaitis, Schellinger, Hones, Grooms & Sampson, 2014).

A post hoc research design was used to complete this study. A quantitative data analysis of the state assessment scores was used to determine whether a difference

existed between improved student-test scores and the implementation of the 1:1 laptop initiative.

The analysis of said data will help determine whether there is a statistically significant difference between the scores prior to the 1:1 laptop initiative and to the scores of students after the implementation of the 1:1 laptop initiative. There were two different groups of students: one without any laptop initiative experience and one who had 1 year of participating in the laptop initiative.

Research Analysis

The math composite scores of students on the NJASK were used for this research. They were taken from independent groups, and an independent *t-test* was calculated to determine a statistically significant difference in test scores of the two groups. Given the use of convenience sampling and the small sample size, a significance level of $p < 0.1$ was chosen. Final data gathered from NJDOE showed the results of state standardized tests from the year while the students were involved in the 1:1 laptop program. The students' data on the statewide test revealed a mean difference with the 1:1 group ($n = 57$) scoring 13 points higher than the control group ($n = 52$) with a $t = 1.889$, $df = 107$, and $p < 0.06$ (actual) or $p < 0.1$ (as selected to accommodate for design limitations).

The research question was established to identify the differences in state assessment-test scores before and after participation in the 1:1 laptop initiative. Two sets of test scores were analyzed from two unrelated groups of students while in the sixth grade. Figure A1 illustrates the comparison of the means from both groups. One group of students (control) was tested before any exposure to the laptop initiative. The other group

of students (treatment) was tested after being exposed to one year of the laptop initiative.

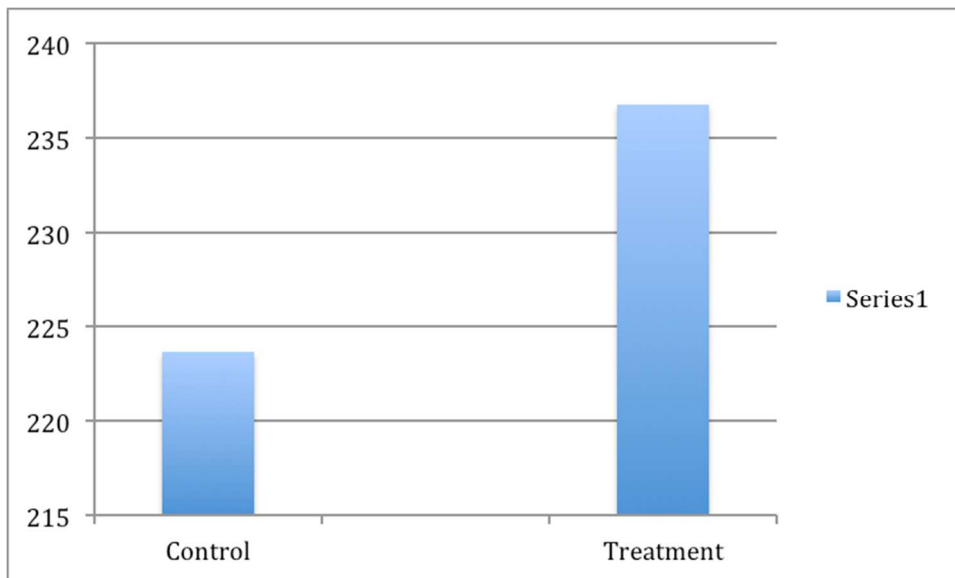


Figure A1. Comparison of mean math composite score.

Summary

The hypothesis for this study was that the implementation of a 1:1 laptop initiative would not increase student assessment scores and thus not meet the objectives established for the 1:1 laptop initiative. Once the math composite scores were calculated (before exposure to the implementation and after exposure to the implementation), the difference between the composite scores was determined.

Recommendations

The following recommendations are made to assist administrators in reviewing an existing 1:1 laptop initiative and areas of emphasis as the initiative moves forward. The results can be used to begin a discussion on how to expand the evaluation to include a broader sample of students with more generalizable findings.

Recommendation 1

Continue the 1:1 Laptop Initiative. Use the process in this study as an example to continue the analysis of the use of laptops. Also, the results can be used to begin a discussion on ways to move the 1:1 laptop initiative forward so that it is feasible and even more successful for the school district in the future.

Recommendation 2

Use the results of the data from state assessments to support the application for grant monies to purchase additional equipment such as on-line textbooks, projectors, increase the types of technology used by the school, etc.

List of available grants for school to investigate:

Ocean First Bank Model Classroom (apply annually)

Apple Foundation – Distinguished School Program (previously received this designation in 2007)

ExxonMobil Foundation Grant (previously received)

Best Buy Teach Awards

Intel Model School

Recommendation 3

Provide annual professional development to all teachers in the building on developing pedagogy utilizing the laptops, along with their textbooks, projectors and necessary curriculum for their area of teaching. New teachers in the building who have not had access to teaching with a laptop may not know the data that is available to customize their teaching practice. This could also provide mentoring opportunities for

newer teachers to help ensure more productive uses of laptops throughout the school. Professional development is already integrated into the district professional development plan, but could be expanded to focus solely on the areas that would be necessary to develop strategies that could be used in various classrooms throughout the school.

Recommendation 4

Expand the 1:1 initiative to the lower grades. Elementary classrooms could have laptop carts for each classroom exposing the students to the use of the laptop for schoolwork. The laptops could remain in the classroom to prevent wear and tear on the laptops with younger students.

Conclusion

The cost of technology has become more affordable, which has led to our 1:1 laptop initiative opening many opportunities for both teaching and learning. The acquisition of 21st-century skills, such as the creative thinking, critical thinking, collaboration, and problem-solving skills is a part of our district's mission statement, as much a part of the education today as the learning of the content.

As school district staff became more comfortable with the technology and began to realize some of the unique advantages of both increased access and having the technology in the classroom, they can perceive technology differently. This generation of students' familiarity with technology and their ability to understand the benefits of it, it is in the best interest of both the student and the teacher to incorporate technology in the classroom. Some instructional technological resources have already been integrated into curricula, and when used properly in classrooms, these devices make teaching and

learning more enjoyable, and also provide educational benefits to students. The results of this study suggest that the 1:1 learning environments prepares students for a globally connected world.

A 1:1 laptop initiative can be implemented and show success in student learning, along with teachers using the current technology to assist in their teaching. I evaluated the current 1:1 laptop initiative and have determined it is meeting the objectives originally established. Thus, with the recommendations contained herein, the existing program can continue to show benefits to the teaching and learning of the students.