One-to-One Learning - Success Factors For Meaningful Technology Integration

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Andrew Kohl

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ONE-TO-ONE LEARNING – SUCCESS FACTORS FOR
MEANINGFUL TECHNOLOGY INTEGRATION

Andrew P. Kohl
Educational Leadership Doctoral Program

Submitted in partial fulfillment
of the requirements of
Doctor of Education
In the Foster G. McGaw Graduate School

National College of Education
National Louis University
March 17, 2019
A THREE-PART DISSERTATION:

ONE-TO-ONE LEARNING: SUCCESS FACTORS FOR MEANINGFUL TECHNOLOGY INTEGRATION

CREATING A SYSTEMIC APPROACH TO TECHNOLOGY INTEGRATION THROUGH JOB-EMBEDDED PROFESSIONAL DEVELOPMENT

ESTABLISHING A PROGRAM FOR TEACHER MICROCREDENTIALS TO SUPPORT INDIVIDUAL PROFESSIONAL LEARNING: A POLICY ADVOCACY DOCUMENT

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Date Approved
This document was created as one part of the three-part dissertation requirement of the National Louis University (NLU) Educational Leadership (EDL) Doctoral Program. The National Louis Educational Leadership EdD is a professional practice degree program (Shulman et al., 2006).

For the dissertation requirement, doctoral candidates are required to plan, research, and implement three major projects, one each year, within their school or district with a focus on professional practice. The three projects are:

- Program Evaluation
- Change Leadership Plan
- Policy Advocacy Document

For the **Program Evaluation** candidates are required to identify and evaluate a program or practice within their school or district. The “program” can be a current initiative; a grant project; a common practice; or a movement. Focused on utilization, the evaluation can be formative, summative, or developmental (Patton, 2008). The candidate must demonstrate how the evaluation directly relates to student learning.

In the **Change Leadership Plan** candidates develop a plan that considers organizational possibilities for renewal. The plan for organizational change may be at the building or district level. It must be related to an area in need of improvement, and have a clear target in mind. The candidate must be able to identify noticeable and feasible differences that should exist as a result of the change plan (Wagner et al., 2006).

In the **Policy Advocacy Document** candidates develop and advocate for a policy at the local, state or national level using reflective practice and research as a means for supporting and promoting reforms in education. Policy advocacy dissertations use critical theory to address moral and ethical issues of policy formation and administrative decision making (i.e., what ought to be). The purpose is to develop reflective, humane and social critics, moral leaders, and competent professionals, guided by a critical practical rational model (Browder, 1995).

**Works Cited**


5/1/19
ABSTRACT

This paper explores an evaluation of the Grove School District’s one-to-one iPad program, for the purpose of understanding the relationship between teacher support for the program and classroom use. The evaluation also explores the various factors that impact a successful one-to-one program, including leadership attitudes and professional development. The attitudes of teaching staff were compared classroom observation data and focus group input. The research design followed a case study approach with a combination of survey, focus group and observation methodologies. The goal was to determine to what extent the attitudes of teaching staff towards the one-to-one program impact the integration of technology into instruction. Teachers were also asked how we might improve the current one-to-one program. This evaluation looked for ways to begin the process of evolving and growing the program in the future. Teachers felt very positive towards the one-to-one program and saw more benefits than challenges for students. Teachers also desired more opportunities to learn about technology integration and collaborate with colleagues and specialists.
PREFACE

This program evaluation was inspired by the work I have done in my school district, launching a one-to-one technology program and stewarding its growth over the past several years. A successful one-to-one program involves much more than merely acquiring funds and equipment. It also involves engaging stakeholders at every level of the organization, creating collective ownership of the program and a desire to use technology to engage students and create new learning experiences for them. It is challenging work for teachers and leaders, but it is essential for education in the 21st century. Just as technology continually changes, schools that employ technology must be nimble in the design and implementation of their program, continually collecting feedback and making changes that will improve the experience for everyone.

Since 1998, I have worked with instructional technology in schools. Initially, as a classroom teacher, I integrated computers and design into my high school and middle school English Language Arts lessons. As I transitioned into the role of instructional technology specialist, I worked with classroom teachers to integrate technology across the curriculum. Finally, as a district administrator, I have always seen the potential for technology to transform teaching and learning, and I have worked to make it a central part of curriculum conversations with teachers. I have experienced great success with some teachers, as we developed terrific learning experiences for students, and learned a lot during the process. I have also experienced the frustrations of rejection from teachers who are resistant to technology integration, and I’ve learned from those conversations as well. Ultimately, teachers need to feel supported during any change. This fact has been a constant for me throughout my time in education.
Finally, I reflect upon my professional learning and how it has allowed me to evolve my thinking and my practice. I entered the teaching profession as an English teacher and did not have a background in technology. Through witnessing the power of technology with students, I learned by doing, as well as from some talented mentor figures and coaches. The path to where I am now has been challenging at times but shaped me into a committed and passionate educator and leader. I hope to shape the technology program in my district, to create a culture for learning that can offer the same opportunities for growth to all educators.
ACKNOWLEDGEMENTS

I would like to acknowledge my wife and children for all of the sacrifices that they made in helping me complete my doctoral degree. For the many early mornings, late nights and days that I was off writing or attending classes, they have been patient, supportive and inspiring to me. I could not have completed this work without them. All my love and appreciation to Karen, Caleb and Maddy.

Thank you to Dr. Brian Wegley and all of the members of my school district’s administrative team. Thank you also to my Board of Education and every teacher who took the time to honestly inform my work. You inspire and challenge me every day, and help me to be a better colleague and educator.

Thank you to my dissertation chair, Dr. Gloria McDaniel-Hall for the time she has taken to guide me in my work. You have been patient with me as I’ve worked, and encouraging throughout. Thank you also to Dr. Jason Stegemoller, for your insight, feedback and encouragement. You have both helped me to be a better writer and researcher, and this work has been possible because of your example.

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SECTION ONE: INTRODUCTION

Purpose

Will Richardson, an educator and technologist, was asked about the impact that technology has had on the field of education. In response, Richardson (2012) said that our contexts for decision making do not acknowledge that with a connection to the Internet, we can now learn anytime we want, anywhere that we are, with whomever we can connect to from around the world at that moment. We now curate and write our own texts. We form our own classrooms. We direct our own curriculums. We assess our own learning. And we no longer simply consume; we create and share with the world. (p. 24)

This statement captures the potential power and challenges of instructional technology. Access to various technologies and the ability to connect with information, collaborate with other learners and create and share new knowledge are essential components for school change and relevant student learning. It is the context in which learning happens today, and it may potentially change the purpose of school for young learners.

Technology Integration has had a significant place in the national educational conversation throughout this young century. Notably, the U.S. Department of Education's (2010) National Educational Technology Plan carried with it a mandate for schools to integrate technology throughout the core curriculum, as well as increasing opportunities for integration in special education and other concentrations. Two important beliefs often propel the move towards technology integration in schools; first, that technology can add value and new opportunities for learning to the curriculum. Second, many believe that it is critical for young people to use technology as they
develop the flexibility in their learning that is relevant to our information culture so that they can be better-informed citizens and prepared for an uncertain future. As educational theorist John Palfrey (2013) wrote in his book, *Born Digital*, “The most important thing schools can do is not to use technology more, but to use it more effectively” (p. 76).

In 2016, the online journal Front Row Education surveyed over 2500 teachers. Their results indicated that more than half of teachers surveyed are teaching in classrooms with one-to-one technology to student ratios (Front Row Education, 2017). The rapid move toward “one-to-one” programs, where a student is given a personal device to carry with them in class, brings with it an increase in the amount of access that students have to technology during the school day. However, the debate about how to best integrate technology into the curriculum still exists and schools still strive to develop the confidence that teachers need to have to facilitate its use in the classroom. Research by So and Kim (2009) suggest that an explanation for the lack of technology integration is related to technological pedagogical content knowledge (TPACK). Developed by Mishra and Koehler (2009), the TPACK framework builds on Schulman's concept of pedagogical content knowledge but adds technology as an additional component. In TPACK, each of these three components influences the others and are part of a coherent instructional conversation. Teachers may have difficulty understanding the complex relationships between technology, pedagogy, and content because these are often taught in isolation in most teacher education programs.

This disparity creates a challenge for leaders, as they strive to understand the supports that teachers need and also to understand where technology’s use might have the most significant impact on learning.
Towards the end of the 20th century, when schools began to introduce computers into classroom instruction, technology learning standards focused squarely on application skills and the need for students to learn the use of technology as a tool. As we entered the 21st century, standards began to look more closely at the ability of students to produce certain learning products and use technology in the context of the curriculum. The 2016 International Society for Technology in Education (ISTE) Standards reflect a shift in focus again, towards learning qualities that are necessary for students to “thrive in a connected, digital world” (ISTE, 2016). The 2016 ISTE standards look at the potential for technology to allow students the ability to curate their learning, function as informed and ethical members of society, and to use technology to construct knowledge and design solutions (ISTE, 2016). These standards reflect the findings of sociologists like Danah Boyd (2014), who has developed a base of research around observing, interviewing and commenting on how young people use technology. In her observations, she found that students have built their lives around the devices in their pockets, and use them constantly to interact with information and to build their own personal learning ecologies.

With the 2016 ISTE standards, an attempt is made to translate this real-world context into a mission for education. As Boyd says in her book, It’s Complicated: The Social Lives of Networked Teens, “Just because teens can and do manipulate social media to attract attention and increase visibility does not mean that they are equally experienced at doing so or that they automatically have the skills to navigate what unfolds” (p.13). Schools and teachers have a unique position to help students reframe technology and social media as engines for learning, and also learn the skills that will help them function as informed citizens.
As technology standards evolve and integrate more closely into core-curricular skills, technology becomes a more frequent occurrence in classrooms. Computer labs and their “appointment-driven” approach to integration could not capture the immediacy that technology demanded. Research began to indicate that when each student has access to an individual device the effects of technology integration on instruction are most likely to be amplified (Warschauer, 2006). The first large-scale “one-to-one” program was Maine’s statewide initiative in 2002, and current research indicates that one-third of all teachers are now in a classroom where every student receives their own device for learning (Zheng, Warschauer, Lin, & Chang, 2016). However, it is clear that the presence of technology is not enough to propel learning. A successful one-to-one program involves multiple factors that inform its adoption and sustainability.

A knowledge-generating evaluation, as Patton (2008) describes, “looks for general patterns and principles of effectiveness across programs, projects, and sites” (p. 141). These studies seek to discover what universal lessons and evaluations can be extrapolated across multiple sites. This study will look at the one-to-one technology program in three schools of a K-8 school district. The purpose of this evaluation is to explore the relationship between teacher attitudes towards technology integration and the effectiveness of the one-to-one program, as well as the role that leadership has to play in fostering teacher understanding of technology integration. If the staff perception of technology in the classroom is different, how does that relate to the way students use technology? Similarly, if teachers do not feel that instructional technology’s role has been effectively communicated or modeled by leadership does that relate to how they view the relevance of instructional technology? Additionally, this study will also build a
better understanding of how school leadership can introduce, support and cultivate a one-
to-one learning program in a manner that ensures success.

Rationale

The one-to-one program that I am evaluating is in a district to which I have a connection. For ten years, I have been an administrator in this school district, and I have worked with colleagues to support technology integration in the district. I’ve come to believe very strongly in the power that technology can bring to learning and student voice, specifically in the areas of digital writing and media. However, throughout my career, I have seen the challenges that can arise during the implementation of an integrated technology program. For example, some educators have difficulty viewing technology as relevant to the curriculum, and hence technology becomes an under-utilized resource in that classroom. Other times, a teacher may not feel comfortable managing a technology-based lesson or student-centered technology project. Also, leadership may incorrectly assume that teachers possess appropriate background knowledge and skills to integrate technology into their lessons, or they may fail to build proper support structures for technology integration. As my district considers their model for technology integration and one-to-one learning, I hope to glean the best possible ways for these programs to grow in a way that will ensure success for students, teachers, and leadership.

Also, I have served in a technology integration role in two previous school districts, and I have seen that there is great potential for technology to transform teaching and learning. Educational technology can play a valuable role in a school and can be a positive force and an accelerator of change. I have also seen that educational technology
can be ineffective when it is introduced, supported or viewed without clarity and consistency. It is my goal to undertake a deep analysis of a one-to-one technology program and learn some reasons behind the successes of the program, or challenges that have hindered its ability to flourish.

**Goals**

The goals of this program evaluation are to create a clearer picture of the role that a teacher’s view and attitude towards integration of technology plays in the success of a one-to-one program and the improvement of classroom teaching as a result, and what effective practices districts can take to ensure the success of a one-to-one technology program. Curtis Bonk (2010) wrote that the world of digital learning is different from the world in which most teachers learned, and that leadership is essential to create opportunities for educators to reflect upon this world and prepare for change. Building upon this idea, The Center for Instructional Technology at The University of South Florida has developed a framework, identifying several factors that lead to a successful approach to technology integration. Their *Technology Integration Matrix* (see Appendix G) looks for characteristics of active learning, collaborative learning, constructive learning, authentic learning, and goal-directed learning, as evidence of higher-level technology integration (Florida Center for Instructional Technology, 2017). The Framework shares much with ISTE’s National Educational Technology Standards in its view of student learning environments and outcomes (ISTE, 2016).

Jing Lei and Yong Zhao (2008) constructed their own framework for evaluating student use of technology (see Appendix F), based upon Bruce and Levin’s taxonomy of technology for learning. Their framework is divided into the following categories:
• Technology use for specific learning tasks with explicit learning goals.
• Technology use for communication
• Technology use for expression, such as writing or publishing.
• Technology use for exploration, such as multi-media projects or games. (Lei & Zhao, 2008)

This study aims to utilize these frameworks to look at whether the educator’s attitudes towards technology impact the types of technology learning that are taking place in the classroom. Also, this study will look at what impact leadership has on the successful adoption and implementation of a one-to-one technology program. I will also consider what impact this program has had on teachers’ practice and views about student learning. Hopefully, this research will add a new facet to a growing body of work around the topic of technology integration and better inform the choices made when introducing and cultivating these important programs within a district.

**Research Questions**

1. Is there a relationship between teacher attitudes towards technology in the classroom and their integration of technology into instruction?

2. What role does professional development play in the successful integration of technology in the classroom?

Related questions to these main questions include:

1. How does administrative leadership in technology affect integration in the classroom?

2. How does the curriculum, including prescribed materials and pedagogy, impact technology integration in the classroom?
SECTION TWO: REVIEW OF LITERATURE

Background

Technology and the Internet continue to play an increasingly important role in our daily lives. According to the 2015 American Community Survey (ACS), administered by the U.S. Census Bureau, 78% of households currently own a desktop or laptop computer, and 75% had a form of mobile computing such as a smartphone or tablet. Also, 77% of households had a broadband internet subscription (U.S. Census, 2015). These numbers represent a massive shift from when the U.S. Census began collecting information about technology ownership and access in 1984 when only 8.2% of households owned a home computer (Fil & Ryan, 2014).

Even before the census began quantifying access to technology, people were beginning to assess the impact that technology could have on education. Seymour Papert’s (1980) seminal work, *Mindstorms* (1980), looked at the computer as an engine for student inquiry and creation. For Papert, computers were a way of making abstract concepts tangible for students. As Papert himself wrote,

“Before computers, there were very few good points of contact between what is most fundamental and engaging in mathematics and anything firmly planted in everyday life. But the computer — mathematics-speak being in the midst of the everyday life of the home, school, and workplace — is able to provide such links. The challenge to education is to find ways to exploit them.” (p. 47)

Technology, particularly mobile technology, has had an immense impact on education. As Tony Wagner (2012) explained in a recent interview, “Assuming a decent
broadband connection, most computer-related work - researching, writing, sharing - can happen at any time and for every student, with little or no advance preparation” (p. 27).

Papert (1993) observes in his later book, *The Children’s Machine*, “Nothing could be more absurd than an experiment in which computers are placed in a classroom where nothing else is changed” (p. 149). In order to leverage the transformation that Papert foresaw and the efficiency that Wagner describes, classroom and curriculum design must change to reflect the potential that a computer in the hands of the learner provides.

In response to the challenges and opportunities that technology offers to schools, the educational technology market has grown to one that commands over $8 billion in global investment money (Craig, 2006). One-to-one programs have become an increasingly common program, providing a consistent platform for these ed-tech innovations, as well as a way of bridging the digital divide in the home.

The Apple Classroom of Tomorrow project, begun in 1986, was among the first significant attempts to integrate technology throughout a classroom, and its associated research informed many future one-to-one planning initiatives. The program involved several schools, chosen from a variety of geographic, racial and socio-economic areas, which were given full classrooms of computers and supporting technology. Each year, additional classrooms joined the program, and a study was conducted, compiling all research (Keefe & Zucker, 2003). The research behind this study looked beyond technical roadblocks and focused on the orientation process that teachers went through, as they became proficient at utilizing, supporting and integrating technology into their classrooms (Keefe & Zucker, 2003).
The first statewide implementation of a one-to-one program was the Maine Learning Technology Initiative in 2002, which provided all 7th and 8th-grade students and teachers with laptop computers, along with additional technical assistance and professional development opportunities (Silvernail & Lane, 2004). The findings from the initiative's study discovered that a one-to-one environment resulted in better classroom organizational skills, increased assignment completion, as well as an observed increase in student engagement by classroom teachers (Silvernail & Lane, 2004). However, teachers also reported in this study that a dip in technical support or professional development had a negative impact on the success of the program. Technology integration was inextricably tied to the technical and instructional supports that were in place around it.

In the decade since Maine’s initiative, one-to-one programs have exploded in major cities, such as Los Angeles and Chicago, as well as small towns. More affordable devices, such as iPads and Chromebooks, have opened more points of entry for schools, allowing school districts to enter the one-to-one arena. However, it takes more than the presence of a device to make a successful program. Several factors can impact a successful one-to-one program.

**Components of a Successful One-to-One Program**

The earliest large-scale one-to-one technology programs sought to bridge the digital divide and provide technology for every student, enhancing the curriculum and creating new learning opportunities. For a program to be successful on any scale, leadership needs to plan carefully and pay attention to several factors. In addition to the technical elements of a one-to-one program, active and engaged leadership is essential for a successful implementation, as well as ongoing, job-embedded professional
development and buy-in from all stakeholders (Fullan, 2001; Oliver, Mollette & Corn, 2012). In this review of relevant literature, I will discuss each of these components and the role that they play in a successful program.

**Planning and Technical Elements**

Fullan (2013) applies his Change Knowledge ideas to technology planning and integration and mentions the need for focus, capacity building and elimination of non-essentials in order to ensure a robust digital learning program. His use of the term focus includes “putting the right people in the right roles” to support, develop, lead and teach in the one-to-one program (p. 67). Capacity building involves providing all members of the program (technical and instructional) with the knowledge and skills needed to do their jobs impeccably (p. 68), and elimination of non-essentials focuses on removing unnecessary roadblocks and distractions from the process, so individuals can focus on applying their skills and knowledge to the project at hand (p. 70).

All of these components are part of strong planning. At the core of this is including an excellent strategic plan, communicating to the school board and other leadership, the purpose for the program, expected outcomes and plans to address focus, capacity building, and any potential roadblocks. The initiative should align clearly with strategic plans so that all stakeholders can understand the goals and communicate the importance of the initiative effectively (Simmons & Martin, 2016).

A plan to deploy and support classroom technology is often overlooked in the research, but anecdotal interview data suggests it is critical for a successful program. Interviews conducted by Storz and Hoffman (2012) in their research indicated a need for ongoing support and coaching, including technology usage, troubleshooting, and
operation, as key to their comfort with the program and their willingness to innovate within their curriculum. Even the research into Maine’s Learning Technology Initiative discovered that the most substantial roadblocks for teachers in their use of technology were poor planning for technical support and available planning time for teachers to collaborate (Silvernail & Lane, 2004).

Research done by Simmons and Martin (2016), around the topic of one-to-one program planning and deployment, encouraged a “staggered” approach to program deployment. Simmons and Martin suggest starting the program in specific schools, in order to concentrate resources and work out any bugs before deploying more widely. This same study prioritized time as an area that needed planning and communication, so there are opportunities for teachers in the new program to plan with one another and “stay ahead of their students” in the work they are doing (Simmons & Martin, 2016).

Similarly, time must allow for technical support staff to familiarize themselves with hardware and networking issues, and establish a system for responding to classroom problems and addressing issues at a scale which may be unfamiliar to them.

**Professional Development**

In every research study about technology integration and one-to-one learning, professional development is a factor that impacts the success of the initiative. Penuel’s (2006) overview of several one-to-one programs identified professional development as related to a successful implementation of the program. Specifically, Penuel identified targeted technology professional development and job-embedded professional learning and planning, with a coach or colleague. These types of professional development
experiences received much more favor than large-group presentations about general technology usage.

Storz and Hoffman’s (2012) research reflected the same priorities as Penuel’s research, with teacher comments favoring professional development that targeted using and integrating technology in their specific content area. Teacher comments also reflected a preference for learning from their peers and coaches, which they felt was more relevant to their needs and gave them time to plan and apply their knowledge to their classroom lessons.

Silvernail and Buffington (2009) examined the role of professional development in a technology-focused mathematics program, and their research indicated that a 200-hour professional development initiative was an effective block of time for changing teaching habits and curriculum design, resulting in increased outcomes for students. The researchers concede that the success of the program and students was primarily due to the planning of professional development, as well as the large amount of time that the district dedicated to the support of the program.

Mazzella (2010) wrote that before teachers can integrate technology effectively, they must have professional development that not only familiarizes them with technologies but also allows them to change their habits and preconceptions. Professional development needs to transcend technical knowledge, but also equip teachers with the skills to easily provide students with the unique learning experiences that technology invites. As Knight (2012) writes, “teachers should be more concerned with using technology as a tool that is integrated effortlessly into classroom instruction rather than teaching about the technology itself” (p. 53).
Drago-Severson (2008) identifies four “pillar practices” to support transformational learning in adults: teaming, providing leadership roles, collegial inquiry, and mentoring. All four of these pillars focus on collaboration between professionals and an opportunity for a teacher to reflect on their practice. Research in the area of one-to-one programs highlights collaborative learning and collegial inquiry as key professional development practices for teachers. Simmons and Martin (2016) highlighted a large number of teachers who specified the value of one-to-one teachers collaborating and learning together. One respondent said “what I have seen in my area is that we feel safer in small groups…. We feel safer in our learning” (p. 30).

According to Shapley, Sheehan, Maloney, and Caranikas-Walker (2010), a critical piece of effective professional development in schools is participant collaboration. Additional research affirms that collaboration-centered professional development resulted in a noticeable change in teaching practice (Silvernail & Lane, 2004). As Simmons and Martin’s (2016) interview data affirms, grouping participants into smaller groups create a higher level of comfort in the learner and also creates opportunities for participants to follow up frequently on their learning.

Schrum and Levin (2013) examined the professional development practices at three excellent 21st century learning schools and identified impactful characteristics of these programs. First, the presence of a technology “coach” to work with teachers as a mentor was a typical role. This individual would not only orient teachers to the technology but also participate with them in the planning and delivery of instruction. This practice allowed a collegial relationship to develop, and also allowed the coach to identify areas of need and development in the staff. Schrum and Levin also cited that
administrators in these schools identified exemplary teachers and created opportunities for them to be leaders for their peers, sharing their knowledge and leading professional development.

Simmons and Martin (2016) asserts in his research that leadership also need professional development, for a successful one-to-one program. He identifies two areas of need for professional development: change management and technology modeling/evaluation. In his research, gaps existed in the administrator’s ability to assist staff in adapting to the changes of a technology-rich learning environment and the ability to plan for long-term support of staff as they adapt to the new model. Additionally, leaders need to understand how to identify and model exemplary technology integration and be able to discuss these practices with teachers as part of their evaluation process.

**Teacher Perceptions toward Change**

According to Fullan (2013), in a technology-rich learning environment, teachers must take on the role of facilitator and students take more ownership of their learning. As Fullan states, “teachers in small groups become leaders, designers and active guides to learning” (p. 47). In this system, the pedagogy changes to accommodate available resources, like technology, as well as for an audience of 21st-century learners. A model for leadership like the one Fullan describes represents a massive change in what teachers may understand about their roles in the classroom, and how teachers respond to these changes can make or break a new one-to-one technology initiative.

As Maschmann (2015) suggests in his research, “school traditions can be generational, and people not born in the technology age may be unwilling to accept the new technology as they perceive some traditions will be lost within this transition” (p.
18). This resistance to change can result in a teacher’s reluctance to commit themselves fully to the initiative. In Maschmann’s research, teachers who viewed the one-to-one initiative as “top-down” or “administrator-led” saw less value in their students’ engagement and scores. Teachers who saw the initiative a “teacher-led” and collaborative saw much more value in the program and the resulting student engagement.

Another factor that strongly impacts teacher perceptions of a one-to-one program is their prior experience with technology. Those teachers who have had technology in the classrooms before, or have experienced a technology-rich learning environment themselves will see more value in the initiative and will apply themselves more thoroughly to developing themselves as educators with technology. Conversely, teachers who have had less experience with technology will de-value the program, in favor of more traditional methods of instruction (Campbell, 2016). In the case of higher-capital teachers in the school, how they regard the program and technology integration can also have a substantial impact on how enthusiastic younger teachers will be towards the program.

Similarly, Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur (2012) found that those who found value in classroom technology implemented it in ways that reflected the value they saw. For instance, a teacher who felt technology was a robust collaborative tool would utilize Google Docs and other collaborative writing tools, while a teacher who found technology more useful in reinforcing skills would utilize the technology to deliver drill programs or “busy work” during free periods (Ertmer et al., 2012).
Ertmer et al. (2012) also found that the barrier that had the most substantial impact on the success or failure of technology integration was the teacher’s attitudes and beliefs about the efficacy of technology in the classroom. Teacher attitude towards technology was a more significant factor than technical support and available professional development time (Ertmer et al., 2012).

Storz and Hoffman’s (2012) research revealed growth among many one-to-one teachers, as the program progressed. Teachers discovered that they were doing more small-group instruction, and using the student laptops for self-directed experiences that supported the instruction she was giving. While teachers still expressed frustrations with classroom management and technology support, one teacher summed up the experience by saying “if we are still doing the same things we did prior to the computers, then we are misusing them” (p. 9).

Other recent research discusses how a one-to-one environment shifts the relationship between student and teacher, creating a more independent learning environment for students and extending the relationship beyond the typical school day. Teachers who are comfortable with these changing roles, and the autonomy that this provides for students, will regard the program more positively and be more receptive to changing their approaches to a new type of learning environment (Higgins, 2015).

**Administrative Leadership**

Leadership particularly that of the building principal, has a massive impact on a school’s success. Fullan (2001) discusses a leader’s critical role in setting the context for change, managing implementation dips and maintaining relationships in an organization. In a school context, a principal’s leadership is critical to school improvement.
ISTE released their National Educational Technology Standards for Administrators (NETS-A) in 2009, to create a framework for defining exemplary leadership for technology initiatives and 21st century schools (ISTE, 2009). Like the student standards, the NETS-A focus on five areas of leadership skills: visionary leadership, digital age learning culture, excellence in professional practice, systemic improvement and digital citizenship. In general, these domain foci on the leader’s ability to utilize technology, model technology use and communicate the value of technology and innovation to their organization. While these standards are not based on empirical evidence, they do introduce some common characteristics which invite more in-depth discussion among educational leaders.

Fullan (2014) wrote that the challenges of 21st-century leadership required more than just a principal, but a leadership structure that involved stakeholders throughout the organization. Technology is not only impacting the structure of the classroom and the curriculum but also the leadership structures that are needed to process the rate of change that we are encountering (Fullan, 2014). Simmons and Martin (2016) found that several of the interview participants in his research re-affirmed the idea of a leadership team. One teacher was quoted as saying:

One thing principals are good at is surrounding themselves with smart people…. So identifying people on staff that can help with this area of weakness… every school should have an instructional technologist or have an assistant principal that is an instructional technologist so the principal can stay up to date on technology and be strong in this area in front of their staff. (p. 33)
This statement reflects a recurring theme in the research: that principals and other school leaders cannot look inadequate in their technology capabilities. This example for teachers will undercut their authority as technology leaders and undermine the perceived value of the one-to-one program. Also, many leaders who lack technical knowledge will also lack the ability to plan, implement and lead the initiative (Simmons & Martin, 2016).

In a one-to-one school or district, leadership needs to model technology use and integration in their daily activities and demonstrate these activities for staff and students. They also need to be able to be an instructional leader, making sure that teachers integrate technology into the curriculum in a mindful manner (Jones & Dexter, 2014).

Shapley et al. (2010) researched organizational behaviors in a technology initiative, and targeted behaviors like involving staff in decisions, clearly articulating goals, participating in professional development and providing resources to the classrooms as impactful towards the success of a program. In the schools surveyed, a strong correlation existed between the presence of these traits and a positive perception of the program by teachers and students (p. 24). In fact, administrative and technical support combine to create a much higher instance of teacher buy-in for the program. Taking the research a step further, a connection can be drawn between leadership practices and teacher buy-in to the level of technology immersion in the classroom. Immersion impacts the amount of access that the student has to technology, which translates into student achievement scores. All of these factors work together in the research, and a deficiency in one area can impact all of the other aspects of the program and its goals (Shapley et al., 2010).
Maschmann (2015) argues that leadership cannot focus squarely on technology integration in the classroom. While this is undoubtedly important, leadership must also focus on budget and sustainability (p. 21). Programs need to make sure that they are financially feasible for the long-term, and leadership needs to communicate the vision to the board and community. Research continues to support the assertion that technology leadership has a much more significant impact on outcomes than infrastructure and budget. Moreover, when leadership is shared among stakeholders throughout the organization, there is greater attention to all of the facets of the program (curriculum, pedagogy, support, vision) and more ability to cope with complex change (Dexter, Richardson, & Nash, 2016).

Ultimately, the success of a one-to-one program can depend mainly on the behaviors and dispositions of the instructional leader. If the leader does not take a systems approach to the initiative, involving teachers, students, and leadership, the initiative could meet with opposition or apathy. However, a leader who can understand the role that technology can play in instruction, and can communicate and model that vision for the school community, the possibilities are endless.
SECTION THREE: METHODOLOGY

Research Design Overview

This case study evaluation explored the experiences of teachers who are participating in a one-to-one learning program, considering their views towards technology integration and the types of learning that are taking place in their classrooms. As Patton (2008) writes, case studies can be especially useful when intended users need to understand a problem in greater depth and within the context of a particular situation (p. 458). In order to add dimension and depth to the case study of one-to-one learning in The Grove School District, I employed a mixed-methods approach to data collection. By definition, “mixed-methods” suggests an approach which employs both quantitative and qualitative practices. Quantitative methods focus on precise measures of things that can be counted, while qualitative methods bring context to the data, “seeking to capture what a program experience means to participants in their own words” (p. 434).

The intention of the case study approach is intended to explore several success factors of the district’s one-to-one technology program. The study examined the district’s program through the lens of the Technology Integration Matrices’ identified factors for success (see Appendix G), as well as Lei and Zhao’s (2008) framework for technology usage (see Appendix F). The study will also tell the story of both the vision behind the program and also how teachers regard the program and how they are being supported and encouraged in their professional learning. According to Yin (2003), case studies are appropriate when the researcher wants to cover contextual conditions because they believe that context is important to the topic being investigated or when the boundaries are not clear between the object of study and the context. In the case of this
A research study, the context under which the one-to-one program operates is critical, because of the ever-changing nature of technology, as well as curriculum, and also the demands that these changes put on teachers in these programs. Educators need to be nimble in their thinking and have the ability to adapt to change when teaching with technology.

The mixed-method design of this study consisted of online surveys, classroom observations and focus-groups with teachers from Grove’s one-to-one classrooms. Educators were interviewed to set the context for the case and to understand how the vision behind the program is perceived. These focus group interviews also describe how the one-to-one program was implemented and communicated to staff, and how teachers have been supported in the area of technology integration. Online surveys were given to one-to-one teachers in each school, to understand teacher attitudes towards technology integration, as well as an audit of the types of learning that they facilitate with technology in their classrooms. Finally, classroom observations recorded any technology-based student activities which took place within the classroom, as well as the frequency of these activities. Later, the observed activities were coded against frameworks to determine the type of activity and the depth of technology integration that this usage represented.

**Participants**

The support and professional development of teachers who work in a one-to-one environment involve many stakeholders, including principals, technology specialists, and district administrators. This case study involved approximately 28 participants from three schools in The Grove School District, grades 3-8. Teachers from one-to-one
classrooms in the district were invited to participate in an online survey, to determine their beliefs about the effectiveness of technology integration and learning, as well as how the one-to-one learning devices are utilized in the classroom. Out of 65 teachers who were invited to participate, 28 teachers completed the online survey. I also invited 24 teachers who taught in one-to-one classrooms to participate in one-hour focus group interviews. Ultimately, 18 teachers elected to participate. Finally, I conducted two separate observations in ten random classrooms from our one-to-one program, to record the variety of technology learning experiences which took place during a class period of approximately 40 minutes. These data will combine to present the teachers’ vision of and approach to technology integration, but will also provide detail and context through the voices of participants in the program.

Data Gathering Techniques

Qualitative social research methodology was used for the collection of data in this mixed-method study. Specifically, focus group interviews with relevant stakeholders were conducted with groups of teachers and administrators. Also, for the collection of quantitative data, voluntary online surveys were given to teachers in each school. Finally, I conducted classroom observations in ten classrooms and learning spaces, recording learning activities that took place in the classrooms, but not names or descriptive information about students. Using these methods, I was able to record data about the teachers and their attitudes towards instructional technology, as well as gain a deeper glimpse into the activities of students in the one-to-one classrooms.
Survey

The data collection described below occurred during the 2017-2018 school year within a northern Illinois public school district. The quantitative research component of this study included an online survey, given to teachers in the participant district. These questions surveyed teacher attitudes toward instructional technology, as well as specific questions about their use of instructional technology in their classroom, and the activities of their students. The questions were a combination of multiple-choice questions and some Likert scale questions, which will allow them to rate their beliefs and uses of technology (see Appendix A). Participants were sent a link to the survey, via their work email addresses, with an invitation to participate. In order to respect and address all ethical considerations of this study, all participants digitally signed a confidentiality agreement before accessing the survey, detailing how their data was collected, analyzed and maintained. All participant names will be anonymous throughout the research, and any personal experiences will be held confidentially. This data will measure the level to which teachers understand the Grove School District’s purpose for instructional technology, as well as how they utilize technology in their classrooms.

Focus Group

The qualitative research component of this study took the form of focus group interviews, with teachers from each of our participant schools. Teachers in one-to-one classrooms received an email, inviting them to participate in the focus group, held at one of the Grove schools. Teachers were informed of the estimated duration of the focus group activity. Of 24 teachers who were invited to participate, 18 teachers took part in the focus group, nine in grades 3-5 and nine is grades 6-8. Questions were asked of each
group, to set the context for the case and to understand the perceived vision behind instructional technology and one-to-one learning in the district, as well as how it was implemented and communicated to staff. Teachers shared the story of their participation in the one-to-one program: how they utilize the devices in their classrooms, what value they find, how they are supported and which areas they feel need additional support (see Appendix B). The transcribed data from these forums will form the context for my research and will add meaning to the quantitative data that I collected. Similarly, this data was collected with informed consent, and any personal information that was shared will be held in confidence. Ultimately, this data will help to determine the connection between district implementation practices of the instructional technology program and the acceptance of the program by teachers.

**Classroom Observations**

In order to gain a deeper understanding of student technology use in the classroom, I conducted observations in ten classrooms. Any student technology use in the classroom was observed and recorded in field notes, which were later coded against Lei and Zhou’s (2008) framework (see Appendix F), as well as against the Technology Integration Framework (see Appendix G). No student names, images or identifying work was collected as part of this observation. The focus of these observations was simply to collect data about student technology use in the classroom, which would later be analyzed to determine the type of learning activity present and the level of classroom technology integration that it represented.
Data Analysis Techniques

Survey data was collected through an online form. Collected data was reviewed, and invalid or empty responses were eliminated. Invalid responses included any surveys which were not completed or which were submitted with any non-translatable language or characters. The survey data was exported into Microsoft Excel for analysis. Also, the online reporting tool Data Hero connected the data within Survey Monkey and was used to display calculated results for analysis. The data examined teacher responses to determine how closely their attitudes toward instructional technology aligned with use of technology in the classroom and the learning experiences that their students have. The process also looked for indicators of how well the district has communicated and supported the one-to-one program and provided a vision by which teachers can understand one-to-one learning. The data also described the various ways in which instructional technology has been used in the classroom, where these practices are represented in the technology integration matrix, and the level of technology integration that is happening in the classroom.

Field notes from classroom observations, which included notes on any use of technology that took place in the classroom, were reviewed and coded into a matrix in Microsoft Excel. From this matrix, the data described the frequency of different types of technology-based learning activities that took place in the classroom, as well as the level of technology integration and type of learning that these activities represented.

The quantitative data may be analyzed using counting and coding of responses, as well as calculating the frequency, percentages and averages of responses. These calculations may be displayed using charts and tables.
Audio recordings of the interviews were transcribed and coded. As Strauss and Corbin (1997) describe as part of their Grounded Theory Methodology, the coding process is an in-depth, process that involves reviewing data multiple times and looking for themes that emerge from the data. After establishing the themes through open coding, in conjunction with identified themes from the Technology Integration Matrix and SAMR Framework, the interviews will be reviewed again to determine statements that relate to the identified themes (Charmaz, 2006). The power of this approach will be the way in which this method allows some themes and contexts to emerge independently from any existing preconceptions.

The qualitative data that was collected will comprise mostly of open coding and analysis of interview transcripts, looking for themes and keywords. This inductive data was used in conjunction with the online survey data to look for alignment with identified factors, as well as for connections between the perceptions of leadership and the responses of teachers. Transcribed responses to open-ended questions were also exported into Excel software for coding and analysis for insights and themes. Categories of responses were determined, based on themes that were drawn from the data.
SECTION FOUR: FINDINGS AND INTERPRETATION

Findings

The primary purpose of this program evaluation was to examine teacher perceptions about instructional technology and any impact that it may have had on a one-to-one program. Also, the research seeks to discover the impact that professional development and educational leadership has on the success of a one-to-one iPad program. Within the program evaluation, I have attempted to measure student uses of technology in the classroom, relative to four levels of technology usage: technology for specific tasks, technology for communication, technology for expression, and technology for exploration (Lei & Zhao, 2008). Additionally, observational data was analyzed against the Technology Integration Matrix, to determine the type of technology use and level of integration that each activity represents. The evaluation seeks to discover if the reality of Grove School District’s one-to-one program reflects educator’s philosophies about technology and if school and district professional development, leadership and curricula is sufficiently supporting the program goals and priorities.

As I described in my Methodology section, the data gathered for this program evaluation was a combination of quantitative (surveys and observations) and qualitative (focus group interviews). The One-to-One program survey was administered online to 28 teachers in grades 3-8. All of these teachers are participants in Grove’s one-to-one program. The participants were asked to answer multiple choice questions about their feelings towards educational technology, as well as Likert-scale questions about the student technology usage they saw in their classrooms. Classroom observations were conducted in ten classrooms, grades 3-8, as well as in the middle school library media.
center. Observations noted student technology use against frameworks to determine the
type of usage and the level of integration that was occurring in the classroom.

Also, part of this program evaluation were two focus groups, conducted with 18
classroom teachers (9 in grades 3-5 and 9 in grades 6-8) from our one-to-one program.
The discussions centered around student technology use that they observed, roadblocks
they noticed in technology integration, professional development needs, and leadership
support. The focus group transcripts were coded for emerging themes and corresponded
to the Technology

Integration Matrix and Research Questions of the Study

Through analysis of the online survey data and classroom observations,
qualitative data suggested various themes about the one-to-one program:

1. Surveyed teachers generally hold positive attitudes toward educational
technology and the one-to-one program.

2. While students use technology frequently in the classroom, the degree to
which technology is used to support higher-level thinking and student-driven
learning is lower.

3. There is an inconsistency with how teachers regard technology professional
development resources.

The qualitative data, which was collected from focus groups with teachers in the
one-to-one program, also suggested themes. Some data confirmed the themes that
emerged in the survey data, while new themes also emerged:

1. Teachers see a great deal of potential in the use of technology in the
classroom.
2. Teachers are concerned about technology literacies that students need to learn about using technology, such as digital citizenship and controlling technology addiction.

3. Teachers appreciate job-embedded professional development with a technology specialist or coach but have varying levels of knowledge about what a traditional coaching cycle is and how these specialists could be utilized in the classroom.

4. Teachers in the one-to-one program feel generally supported by leadership and the technology department, but desire more time to collaborate and plan with colleagues.

These themes will emerge through a review of my initial research questions: attitudes towards technology integration and technology use in the classroom, feelings about professional development and curriculum, and feelings about leadership support for technology programming.

**The Relationship between Teacher Attitudes towards Technology and Technology Integration**

The first question that I asked in my research was if there is a relationship between teacher attitudes towards technology in the classroom and the integration of technology into instruction. In addressing this question, I will first review online survey and focus group data regarding teacher attitudes towards technology in instruction. Then, in reviewing student technology use in the classroom, I will begin with a review of focus group data regarding the teacher’s views of student technology use, followed by an
exploration of online survey data and classroom observation data of student technology use.

**Attitudes toward Technology Integration**

One-to-one classroom teachers who responded to the online survey were positive in their agreement about the power of technology in the classroom. The first questions of the survey measured the potential that technology had for teachers and students. All teachers agreed or strongly agreed that technology is empowering for students and teachers.

Table 1

*Technology Empowers Teachers and Students with a Wide Variety of Resources for Teaching and Learning*

<table>
<thead>
<tr>
<th>Response Level</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>67.87%</td>
<td>19</td>
</tr>
<tr>
<td>Agree</td>
<td>32.14%</td>
<td>9</td>
</tr>
<tr>
<td>Not Sure</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0%</td>
<td>0</td>
</tr>
</tbody>
</table>

Similarly, 82% of teachers disagreed or strongly disagreed with the statement that technology did not affect student knowledge.
Table 2

*Technology in Instruction does not Enrich Students’ Knowledge*

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>3.57%</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Not Sure</td>
<td>14.29%</td>
<td>4</td>
</tr>
<tr>
<td>Disagree</td>
<td>46.43%</td>
<td>13</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>35.71%</td>
<td>10</td>
</tr>
</tbody>
</table>

Looking more deeply into types of instruction, 89% of teachers strongly agreed or agreed that technology was a strong component of experiential learning.

Table 3

*A Curriculum with a Focus on Experiential Learning Greatly Enhances Opportunities for Instruction with Technology*

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>42.86%</td>
<td>12</td>
</tr>
<tr>
<td>Agree</td>
<td>46.43%</td>
<td>13</td>
</tr>
<tr>
<td>Not Sure</td>
<td>10.71%</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0%</td>
<td>0</td>
</tr>
</tbody>
</table>

When asked if they felt technology promoted better classroom instruction, 82% of teachers agreed with the statement, with 18% unsure about or disagreeing with the statement.
Table 4

A Technology-Integrated Curriculum Promotes Better Classroom Instruction

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>46.43%</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>35.71%</td>
<td>10</td>
</tr>
<tr>
<td>Not Sure</td>
<td>10.71%</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>7.14%</td>
<td>2</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Seventy-five percent of teachers also felt that technology increases interaction in the classroom, with 25% of respondents unsure or disagreeing with the statement. A larger number of respondents (93%) felt that technology helped to reach students with diverse learning styles.

Table 5

When Technology is Part of Instruction it Increases Interaction in the Classroom

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>28.57%</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>46.43%</td>
<td>13</td>
</tr>
<tr>
<td>Not Sure</td>
<td>21.43%</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>3.57%</td>
<td>1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 6

*Educational Technology Helps Teachers to Reach Students with Diverse Learning Styles*

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Not Sure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.29%</td>
<td>53.57%</td>
<td>0</td>
<td>7.14%</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Data from focus group conversations suggested that teachers felt technology created new opportunities for students to think differently and analyze information. One such quote, from a fourth-grade teacher suggests this:

> Not only do they get to decide the project, but also what app they can use for the project, and then what goes into that when they’ve made the decision. I feel like it is deepening their thinking skills and really considering who their audiences are.

Another teacher reflected on how the presence of the iPad impacted the way that teachers can plan and deliver instruction:

> It’s really shifted the way that we teach (science) because students have access to every scientific fact. We don’t need them to memorize formulas anymore because there’s no need. In the real world, you have access to everything, so it’s really shifted the way we think about how we educate.

Focus group responses also supported the idea that technology was a powerful tool for reaching diverse learners. Several teachers brought up student choice as a critical component that technology has made more accessible. Students have more say in their
projects and the tools they can use to complete them. One middle-school teacher commented:

A big game-changer when we did go one-to-one was that it allowed students to have complete choice and control over their creations, versus a teacher putting ‘here is your project. Here is your shoebox, go make it’.

Another teacher mentioned that the element of choice has opened up possibilities for her struggling students, introducing tools and products that they hadn’t had available to them before:

When students have the option of using technology, it’s interesting to see which students choose that, versus paper and pencil. So, some students who are normally struggling will gravitate towards using technology, which tells me where their abilities lie and what engages them.

Despite the positive comments and survey data regarding the effectiveness of educational technology and one-to-one learning, teachers still identified roadblocks to success in the program. The biggest challenge that teachers identified were areas of information literacy, digital citizenship and technology addiction. Teachers understood that, as students encountered more information during their independent research, they needed teachers to help them evaluate and apply that information to their schoolwork:

Students have so much at their fingertips. So, for us, to figure out a way to guide them along in that, I think is going to be really important.

One fifth-grade teacher reflected on the differences between the current reality and teaching with a more paper-based information flow:
I think it’s still hard for kids to decipher what the true answers are. In a textbook or encyclopedia, it gave them one specific thing, versus analyzing information coming into them and really being able to figure out what the best answer is.

Teachers also noted that students needed to manage their ability to disengage from technology when called upon to do so. The presence of technology in the one-to-one program, while empowering for students, also presented challenges for the kids who are not able to put the device away when the time comes to do so:

I am still working with kids who cannot stay on task with technology. I feel that as time has gone on, they have become much quicker at getting in and out of where they aren’t supposed to be.

One fourth-grade teacher took her response a level deeper and expressed concerns about addictive behavior with technology:

I find that some of my kids are truly addicted. I mean, we are talking, you know, if it were another substance they would be in treatment. What I have seen over the past 20 odd years is that they can’t disengage, every single second they have to be doing something…

Ultimately, the teachers expressed appreciation for the district’s digital citizenship program, which spends time each fall, orienting students in the one-to-one program about proper classroom behavior, internet safety, and online behavior. Several teachers echoed the sentiments of one teacher, who felt that the citizenship program could do more than it currently did:
I know we do digital citizenship, but that conversation should be not just a fall session with a technology specialist. That should be an all-year conversation that we have continually with kids. I think some teachers do and some don’t.

Despite the roadblocks that teachers identified in the one-to-one program, most teachers were very positive about the program and no participants wanted to go back to a time when devices were not given to students. One middle school teacher summed up her feelings succinctly:

It’s like the class and the curriculum is alive. It sometimes can be a distraction, I know, but the benefits outweigh the negatives by far, just to see the kids so engaged.

**Types of Technology Usage in the Classroom**

In our focus groups, teachers were very pleased with how the iPads introduced new efficiencies into the classroom. Students were better able to organize themselves and produce detailed notes. One middle school language arts teacher summed it up in this quote:

The iPad has been pretty invaluable for Language Arts class. They are able to take pictures and add them to notes. Just the device, with Google drive and tools like that, it has made the class a lot more streamlined.

Teachers mentioned the efficiencies that the iPad introduced into their classrooms across the curriculum. All represented subject areas were able to benefit from additional organization and time management that the iPad brought to their classrooms:

With math, I love that they’re working on their iPads. We don’t have to take the time to write on the board too. They just reflect (mirror their iPad display to a
projector) what they are doing on the screen, and everybody can see their work, without all that extra time going into it.

Similarly, teachers were pleased with the organization and ease that the iPads brought to accessing information. Students are now able to research on the spot, in a much more natural way. This shift allows teachers more time to work with students on research skills and the cognitive aspects of the research process.

I love the live research component (of the iPads). Kids can just open their iPads and can search, like what is the latest news and information on a certain topic.

Another teacher echoed this sentiment:

I agree with that live research component. I have so many (gifted) students that will ask me questions, and I have no idea… they can just Google it and figure it out. Five minutes later they’ll raise their hand and share the information, even if it’s not something that we are looking at right away.

Teachers also observed the effect that the one-to-one program had on student collaboration. Online sites like Google Docs, Kidblog and Schoology provide spaces for students to have discussions and work together on projects. Teachers noted that the students who are active in these spaces are not always the same students who are active in the classroom:

I think it’s given a voice to students who wouldn’t necessarily have spoken up in class, but they will if they are having a conversation on Kidblog or Schoology (online classroom forums). As a teacher, it’s so helpful to me to just read back through what they have posted and see the growth in their thinking to what they’re writing now, and actually use that in conferences.
On the internet survey, teacher participants were given a Likert-scale question to indicate how often they incorporated technology into various teaching methods. In their assessment, technology played a significant role in transforming lecture, practice assignments, reading and writing. Classroom activities like media creation and data analysis were more occasionally integrated, but this may be more a function of the curriculum than classroom instruction. Very few classes incorporate those types of lessons on a daily basis.

Table 7

How often do you incorporate technology with the following classroom activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>Seldom</th>
<th>Occasionally</th>
<th>Almost Daily</th>
<th>Daily</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture / Presentation</td>
<td>0.00%</td>
<td>0.00%</td>
<td>25.93%</td>
<td>40.74%</td>
<td>33.33%</td>
<td>27</td>
</tr>
<tr>
<td>Discussion</td>
<td>3.70%</td>
<td>18.52%</td>
<td>51.85%</td>
<td>11.11%</td>
<td>14.81%</td>
<td>27</td>
</tr>
<tr>
<td>Drill / Practice Assignments</td>
<td>7.69%</td>
<td>30.77%</td>
<td>30.22%</td>
<td>26.92%</td>
<td>23.08%</td>
<td>26</td>
</tr>
<tr>
<td>In-Class Research</td>
<td>3.85%</td>
<td>38.46%</td>
<td>34.62%</td>
<td>26.92%</td>
<td>19.23%</td>
<td>26</td>
</tr>
<tr>
<td>In-Class Reading</td>
<td>11.54%</td>
<td>34.62%</td>
<td>50.00%</td>
<td>29.63%</td>
<td>19.23%</td>
<td>26</td>
</tr>
<tr>
<td>In-Class Writing</td>
<td>7.41%</td>
<td>18.52%</td>
<td>30.77%</td>
<td>29.63%</td>
<td>19.23%</td>
<td>26</td>
</tr>
<tr>
<td>Projects involving problem solving</td>
<td>3.85%</td>
<td>38.46%</td>
<td>50.00%</td>
<td>11.54%</td>
<td>11.54%</td>
<td>26</td>
</tr>
<tr>
<td>Projects involving data analysis</td>
<td>15.38%</td>
<td>19.23%</td>
<td>38.46%</td>
<td>19.23%</td>
<td>7.69%</td>
<td>26</td>
</tr>
<tr>
<td>Creating original products (video, music, presentations)</td>
<td>14.81%</td>
<td>44.44%</td>
<td>14.81%</td>
<td>14.81%</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

Teachers were then asked to indicate how often they observed students using their iPads doing various activities. The most frequently observed practices were those
classified as “standard” classroom behaviors, such as note-taking, writing, homework, and research. More creative pursuits, like creating art, video, and music, were observed less frequently.

Table 8

*How often do you observe students using their iPads for the following activities?*

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Occasionally</th>
<th>Almost Daily</th>
<th>Daily</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note Taking</td>
<td>7.14%</td>
<td>10.71%</td>
<td>28.57%</td>
<td>17.86%</td>
<td>35.71%</td>
<td>28</td>
</tr>
<tr>
<td>Homework Completion</td>
<td>3.57%</td>
<td>7.14%</td>
<td>35.71%</td>
<td>17.86%</td>
<td>35.71%</td>
<td>28</td>
</tr>
<tr>
<td>In-Class Writing Assignments</td>
<td>7.14%</td>
<td>3.57%</td>
<td>10.71%</td>
<td>39.29%</td>
<td>39.29%</td>
<td>28</td>
</tr>
<tr>
<td>Research online / databases</td>
<td>3.57%</td>
<td>3.57%</td>
<td>32.14%</td>
<td>35.71%</td>
<td>25.00%</td>
<td>28</td>
</tr>
<tr>
<td>Reading Novels (for school or pleasure)</td>
<td>3.57%</td>
<td>7.14%</td>
<td>53.57%</td>
<td>17.86%</td>
<td>17.86%</td>
<td>28</td>
</tr>
<tr>
<td>Creating Video</td>
<td>7.14%</td>
<td>14.29%</td>
<td>53.57%</td>
<td>14.29%</td>
<td>10.71%</td>
<td>28</td>
</tr>
<tr>
<td>Creating Music / Podcasts</td>
<td>25.00%</td>
<td>32.14%</td>
<td>28.57%</td>
<td>3.57%</td>
<td>10.71%</td>
<td>28</td>
</tr>
<tr>
<td>Creating visual art /drawing</td>
<td>14.29%</td>
<td>17.86%</td>
<td>50.00%</td>
<td>7.14%</td>
<td>10.71%</td>
<td>28</td>
</tr>
</tbody>
</table>

These self-assessments are generally consistent with the classrooms that I observed and coded against Lei and Zhou’s (2008) framework. Students used technology in the classroom much more frequently for specific learning tasks (practice websites, notes), as well as communication and expressing themselves in writing on blogs or shared documents. Some students utilized their iPads for exploring information on the internet, particularly as part of classroom discussion. Some students also utilized their iPads to make videos, some for class and some for personal use.
My observations in the LMC (Library Media Center) were conducted during student free-time, and the variety of activities were much higher. Students still consulted their iPads to stay organized and work on assignments, but there was also more independent consumption of the internet, particularly YouTube, as was well as more creation of videos and music in iMovie and Garage Band, respectively.

Table 9

*Observed Types of Technology Activities in School Settings* (avg. number of interactions in a class period)

<table>
<thead>
<tr>
<th>Technology used for specific tasks</th>
<th>ELA (23)</th>
<th>Math (22)</th>
<th>Science (20)</th>
<th>Soc. Studies (20)</th>
<th>LMC (34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology used for communication.</td>
<td>5</td>
<td>20</td>
<td>22</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Technology used for expression.</td>
<td>23</td>
<td>22</td>
<td>22</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Technology used for exploration</td>
<td>18</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

*Note. Average class sizes for each content area in parenthesis.*

When I observed and coded classroom technology usage against the Technology Integration Matrix, activities were more frequently at the entry or adoption level of integration, meaning that the activities were more teacher-directed and conventional in their use. This level of integration, while still useful and practical, is also more teacher-centered and guided. Higher-level activities that involved more choice and independent knowledge were highest in the collaborative learning domain, where the iPad was used
with sites like Google Docs, Schoology and Kidblog to create spaces for students to share ideas and plan together. The matrix domain of “Authentic Learning” also revealed a significant amount of student activity, as teachers start to incorporate more independent uses of technology, as well as more choice regarding the apps that a student could choose to complete a task. Again, these observations are consistent with the online survey data and the comments that teachers shared in the focus groups.

Table 10

Classroom Activities Relative to the Technology Integration Matrix

<table>
<thead>
<tr>
<th></th>
<th>Entry Level</th>
<th>Adoption Level</th>
<th>Adaptation Level</th>
<th>Infusion Level</th>
<th>Transform Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Learning</td>
<td>94%</td>
<td>94%</td>
<td>93%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Collaborative Learning</td>
<td>98%</td>
<td>90%</td>
<td>96%</td>
<td>92%</td>
<td>31%</td>
</tr>
<tr>
<td>Constructive Learning</td>
<td>98%</td>
<td>100%</td>
<td>77%</td>
<td>16%</td>
<td>-</td>
</tr>
<tr>
<td>Authentic Learning</td>
<td>78.7%</td>
<td>68%</td>
<td>21%</td>
<td>35%</td>
<td>-</td>
</tr>
<tr>
<td>Goal-Directed Learning</td>
<td>82%</td>
<td>92%</td>
<td>67%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

One important note from the Technology Integration Matrix notes is the concept of student choice. On the matrix, student-directed learning exists at the Transformation Level. While focus group discussions mentioned student choice quite a bit as a
classroom use of the iPads, it did not reveal itself in the data. This is an area for deeper observation in a future study and would certainly add value to this current research.

**The Role of Professional Development in Technology Integration**

The second research question that I asked was what role professional development plays in the successful integration of technology in the one-to-one program. In addressing this question, I will begin with a review of online data regarding teacher attitudes towards professional development. Then, I will review focus group data regarding teacher’s views of Grove’s professional development for the one-to-one program.

As I discussed in my literature review, professional development is a crucial component of a successful one-to-one program. One-to-one teachers at Grove School District have strong feelings about professional development, as it relates to technology integration and the one-to-one program. Ninety-two percent of teachers did feel that curriculum support was an important part of integrating technology into instruction.

Table 11

*Curriculum Support is an Important Part of Integrating Technology into my Instruction*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Not Sure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>21.43%</td>
<td>71.43%</td>
<td>3.57%</td>
<td>3.57%</td>
<td>0</td>
</tr>
<tr>
<td>Count</td>
<td>6</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
However, there were varying levels of agreement about whether resources for technology professional development were readily available. When asked on the survey, 54% of teachers agreed that resources were available, but 46% of teachers either disagreed or were unsure.

Table 12

*Technology Professional Development Resources are Readily Available to me*

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>10.71%</td>
<td>3</td>
</tr>
<tr>
<td>Agree</td>
<td>42.86%</td>
<td>12</td>
</tr>
<tr>
<td>Not Sure</td>
<td>28.57%</td>
<td>8</td>
</tr>
<tr>
<td>Disagree</td>
<td>17.86%</td>
<td>5</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Similarly, teachers were less comfortable with how well technology professional development was able to address their specific content area needs. Equal numbers of teachers (36%) agreed and disagreed with the statement that professional development is currently able to address their needs related to technology integration in their curricular area.
Table 13

Professional Development is Currently Able to Address Issues that are Directly Related to Technology Integration in my Curricular Area

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>3.57%</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>35.71%</td>
<td>10</td>
</tr>
<tr>
<td>Not Sure</td>
<td>25%</td>
<td>7</td>
</tr>
<tr>
<td>Disagree</td>
<td>35.71%</td>
<td>10</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

While 57% of teacher participants agreed that technology professional development took place when they had a need, 32% of teachers were unsure or disagreed with the statement.

Table 14

Technology Professional Development Takes Place When Teachers Have a Specific Need

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>10.71%</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>57.14%</td>
<td>16</td>
</tr>
<tr>
<td>Not Sure</td>
<td>17.86%</td>
<td>5</td>
</tr>
<tr>
<td>Disagree</td>
<td>14.29%</td>
<td>4</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Further investigation into the previous question shows a difference between elementary school teacher and middle school teacher responses, with middle school
teachers much more likely to disagree with the question. This difference is likely related to the presence of technology integration coaches in the elementary schools, but not currently in the middle school, where the specialists come to classrooms on an as-needed basis.

When asked about technology integration specialists. Seventy-five percent of teachers felt that the technology integration specialists were able to support their integration needs.

Table 15

Technology Integration Specialists are Available to Support my Integration Needs

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>32.14%</td>
<td>9</td>
</tr>
<tr>
<td>Agree</td>
<td>42.86%</td>
<td>12</td>
</tr>
<tr>
<td>Not Sure</td>
<td>10.71%</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>7.14%</td>
<td>2</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>7.14%</td>
<td>2</td>
</tr>
</tbody>
</table>

In the survey data, teacher responses suggested that teachers mostly felt that there was time available for professional development. Over half of the respondents agreed or strongly agreed with the statement that Grove has created time for technology professional development offerings.
Finally, one question in the area of professional development that seemed to elicit the most inconsistent response was regarding teacher involvement in designing professional development activities. When asked to respond to the statement “teachers are included when designing professional development activities, 28% of respondents agreed or strongly agreed, while 82% either disagreed or weren’t sure.

Table 16

*The District has Created Time for Technology Professional Development Offerings*

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>7.14%</td>
<td>2</td>
</tr>
<tr>
<td>Agree</td>
<td>46.43%</td>
<td>13</td>
</tr>
<tr>
<td>Not Sure</td>
<td>17.86%</td>
<td>5</td>
</tr>
<tr>
<td>Disagree</td>
<td>25%</td>
<td>7</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>3.57%</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 17

*Teachers are Included when Designing Professional Development Activities*

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>3.57%</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>25%</td>
<td>7</td>
</tr>
<tr>
<td>Not Sure</td>
<td>39.29%</td>
<td>11</td>
</tr>
<tr>
<td>Disagree</td>
<td>17.86%</td>
<td>5</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>14.29%</td>
<td>4</td>
</tr>
</tbody>
</table>
In focus group conversations, many of the conversations around professional development for the one-to-one program centered on the presence of a technology integration specialist, who works with the teacher in a job-embedded model.

I think working like sort of a job-embedded PD, where (the specialist) comes in and does things with me, that’s actually how I feel I learn the best and the students get the most. Rather than (the specialist) just walking me through an app and telling me like, “Oh, you could use it for this, or you could use it for that.” We’ll plan things together, and then she’ll actually come in and teach with me.

Focus group teachers repeatedly mentioned the importance of the specialist having teaching experience in the classroom and being able to understand and explain technology integration from a teacher’s perspective:

I mean she is a teacher, so she engages with us and that's so helpful. It's like co-teaching at least for a couple of days. You know, and then we are off on our own, but whoever is still available… I think that for me is a great way to jump into learning.

An interesting difference between elementary school teachers and middle school teachers is that elementary teachers had a better understanding of a traditional coaching cycle, involving planning, co-teaching and follow up:

I mean if you just sit in a meeting and someone shows you something, but you're not doing it with kids, you know it's not going to stick as much, and you're going to leave. It will be like - or at least for me, I feel kind of timid, I can't really remember how to do this, I don't want to dive in with my students, but if you have that person with you. And it's the same - we do the same with science. I mean
that's - that's the best way because you see somebody teach it and then you know, you have - you live it, and then you're able to do it on your own.

Middle school teachers, while very complimentary of the technology integration specialists in the district, look at them from a more “transactional” lens, where they provide tools and resources when needed, but are not part of an ongoing professional development cycle:

I feel really comfortable reaching out to (the technology specialist) when needed. It’s a good system where I feel supported when I need it as long as the teachers are willing to self-advocate and reach out - that works nicely.

Middle school teachers expressed the most concerns about technology professional growth when it came to discovering new resources and practices. Several teachers expressed a feeling of isolation from new ideas. While they did not discuss a job-embedded approach with a coach, they wished that the district would create more collaboration time for teachers to share ideas and tools with each other:

But I also – there’s so many cool things that people are doing. I don’t think the teachers think they’re cool. I’m sure there’s something I’m doing that someone would be like, “That’s so cool.” But I’m like, “What, I do it every day, what are you talking about?” Some teachers do awesome things on Schoology and I want to learn about that, but I just haven’t the time where I can do that. To learn what you all are doing, that would be so awesome. I know we’ve been kind of imprisoned with other PD, but maybe if we can…

This quote suggested some concerns about the amount of time teachers have for professional learning and collaboration, as well as the limitations that content places on
what teachers can explore in PD. As the survey data showed, teacher responses suggested that teachers mostly felt that there was time available for professional development. However, in focus group conversations, the idea of time for professional learning came up frequently. Like the previous quote, teachers expressed a desire for more time to work with one another, and also time to share their practice with each other. One teacher suggested a “pineapple chart” model for open classroom observations and sharing:

There’s an interesting PD structure that we’ve seen, called the pineapple chart. I don’t know if you’ve heard about this before. But the pineapple is like the Hawaiian sign for a welcome. It’s this idea, this structure that your classroom is always open to everybody else in the school for observation. It kind of breaks down the walls, of being like ‘this is my room’ and more like ‘this is our room’ and ‘these are our kids’ and you are welcome to come in anytime.

As the Focus Group data suggests, teachers value learning from one another, or in a job-embedded setting, and they feel like the majority of formal professional growth is still top-down, instructor-led and not collaborative. They desire to have a stronger voice in carving out time for collaborative professional development, between colleagues.

**How Does the Curriculum Impact Technology Integration?**

A secondary research question that I asked was what role the curriculum, including prescribed materials and pedagogy, plays in the successful integration of technology in the one-to-one program. I will begin looking at online survey data that informs this question, followed by an exploration of focus group data on the topic of curriculum and technology integration.
On the online survey, teachers were asked if the rigidity of the curriculum made it difficult to integrate technology into instruction. Sixty-eight percent of teachers disagreed or strongly disagreed with this statement, with only 18% of teachers agreeing with it.

Table 18

*The Rigidity of the Curriculum makes it Difficult to fit Implementation of Technology into my Instruction*

| Strongly Agree | 7.14% | 2 |
| Agree          | 10.71% | 3 |
| Not Sure       | 14.29% | 4 |
| Disagree       | 50%    | 14 |
| Strongly Disagree | 17.86% | 5 |

During the focus group conversations, when teachers were asked this same question, teachers were very clear that they felt Grove had a strong curriculum, which didn’t inhibit their integration of technology. One sentiment that did emerge from the focus group conversations was the desire for a stronger technology presence in the mapped curricula, to guide professional development and integration. One teacher commented:

I think if we - if there was a push in education to focus on some technology standards as well as reading, language arts, writing, oral language, because our kids are moving into a world of technology, but yet there are no standards set for common core.
Teachers agreed that it would be easier to integrate technology if specific skills were more clearly articulated in the Common Core curriculum for Language Arts and Math. Teachers were very positive about the usefulness of technology in these areas, but they did feel that a stronger presence in the curriculum maps would help them know that they are hitting their targets for instruction.

**How Does Administrative Leadership Impact Technology Integration?**

Another secondary research question that I asked was what role administrative leadership plays in the successful integration of technology in the one-to-one program. I will begin with a review of online survey data that informs this question, followed by an exploration of focus group data on the topic of leadership and technology integration.

Teachers in the Grove School District were generally positive about the support for the one-to-one program and the leadership displayed by administrators. Seventy-two percent of survey respondents agreed or strongly agreed that leadership modeled the effective use of technology for them.

Table 19

*Leadership Models the Effective use of Technology when Conducting Presentations, Workshops or Meetings*

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>3.57%</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>67.86%</td>
<td>19</td>
</tr>
<tr>
<td>Not Sure</td>
<td>17.86%</td>
<td>5</td>
</tr>
<tr>
<td>Disagree</td>
<td>10.71%</td>
<td>3</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
While 64% of teachers agreed or strongly agreed that leadership provided them with training in technology and follow-up support, 32% of teachers disagreed with this statement, suggesting that this is an area that may benefit from future research and attention.

Table 20

*Building or District Leadership Provides Teachers with Training in Technology and Follow-up Support with Integrating Technology into Classroom Instruction*

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>17.86%</td>
<td>5</td>
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<td>Agree</td>
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<td>Not Sure</td>
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<td>Disagree</td>
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<td>Strongly Disagree</td>
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Similar to the professional development discussion, the biggest concerns that teachers expressed was the ability of leadership to create time for them to work together and plan more technology integration. A majority of teachers (65%) disagreed or were not sure if they agreed that time is made for teachers to collaborate on developing new instructional strategies with technology.
Table 21

*Time is made Available for Teachers to Work with Others to Develop new Instructional Strategies with Technology*

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<tr>
<td>Strongly Agree</td>
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<td>Agree</td>
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</tr>
<tr>
<td>Strongly Disagree</td>
<td>3.57%</td>
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In the focus group discussions, teachers expressed concerns about the amount of work that they are expected to do and were looking for leadership to help them find solutions for the lack of time to do anything well.

It is a huge amount of stuff rolling down on the classroom teacher because we are responsible for inputting material for various math programs and generating all sorts of reports and feedback - I mean it is incredibly huge. So, nothing is ever taken away as we have always said, and we still have all the other things to do, there really isn't time to do everything. And I do not know how anybody could possibly improve that situation for us.

Elementary school teachers raised the idea of shifting the schedule to allow for less structure – letting teachers cover the content at their own pace and sequencing, as opposed to a more “block” schedule.

But instead of making my schedule blocked with a set structure for covering content, if I could move to an integrated way of teaching from the moment the
kids are in my room till they’re done, it’s just a mix of everything. That’s just personally – I would like to do that.

Regarding technology, teachers did observe that school leadership did not put undue pressure on them to integrate technology. For instance, the use of technology was not expected to raise test scores, and technology integration in the classroom was not quantified. In general, teachers felt supported by the administration:

I know we are expected to do a lot with technology, but I personally feel like we're not pressured. It's not like 'you got to do it, you got to do it'. I mean yeah, it's encouraged. So it's good, and I know we have to do a lot of things, but you know, it could be lot more.

**Interpretations**

Overall, the collected data shows that there is a positivity around the one-to-one program. Most teachers (68% surveyed) feel very strongly that there is value to technology in the classroom, that it enhances their instruction and helps to reach a greater variety of learners. Seventy-four percent of teachers surveyed agreed or strongly agreed that technology increased interaction in the classroom and increased the ability to reach students with different learning styles. Classroom observation data also evidenced a great deal of technology usage in the classroom, which suggests that a positive attitude towards the one-to-one program resulted in more use in the classroom. This observation is underscored by the focus group data, where teachers commented about the value they saw in the one-to-one program. Teachers in both the elementary and middle school focus groups commented on the value of the devices for student research and information literacy, collaboration and interactions with one another. Even when discussing the
roadblocks that exist for technology integration, teachers were very quick to reiterate that they still supported the program and wanted it to grow.

Classroom observations did reveal frequent technology use during the period, although much of the technology usage did not enter the “infusion” or “transformational” level of the matrix. Students often used the devices for accessing information, organizing themselves and writing to a teacher prompt. This level of technology usage suggests that there is still work to do with teachers, in the area of deeper integration. During the introduction of the one-to-one program, the Common Core curriculum initiative began to demand more professional development time and affected the amount of time that specialists and teachers could meet to discuss technology. This lack of time may explain how the level of integration has stalled in many classrooms. Teachers are quite comfortable having the iPad devices in the classroom but are ready for the next step in how they can use them. As one middle-school teacher stated, “I feel like now we understand what we need much more and it would be more useful to go back to some of the tech conversations we had when we started (the one-to-one program).”

Teachers did bring up some roadblocks and challenges to technology integration, in the areas of classroom management and information literacy. Throughout the one-to-one program, student distraction has been a challenge, and newer resources like Apple Classroom have been put in place to allow teachers to better monitor and direct student activity on the devices. The Apple Classroom resource was brought up in the Middle School focus group, and teachers were very excited to learn more about the tool, suggesting another area of collaboration and professional development.
The topic of information literacy, or digital citizenship, represented a very different discussion at the elementary and middle school levels. The discussion among the elementary school teachers included a review of the digital citizenship curriculum, which is currently in place and delivered by the technology coaches during the first six weeks of school. Students in grades 3-5 are not allowed to bring their devices home until they complete the digital citizenship lessons. Teachers were positive and appreciative about the digital citizenship curriculum, though they still felt students needed “refreshers” on the topic all year. Teachers had mentioned that the classroom teachers should revisit these lessons throughout the school year.

The middle school at Grove does not offer a digital citizenship curriculum. Instead, teachers weave these topics into the Second Step lessons that they teach during advisory classes. Second Step has been a topic of review at the middle school for the past year, and the lack of a digital citizenship component has been an area of concern. The comments in the focus group reflect this concern and underscore the need for this conversation with students. This area of the discussion with the middle school teachers also raised questions about the current setup in the technology department, where technology specialists are housed at the elementary schools and are often more closely woven into school initiatives and job-embedded professional learning opportunities.

Survey data found that over 78% of teachers felt that they were competent in the use of technology and 75% felt that there were technology specialists available to help them with issues around technology integration. However, fewer teachers felt that technology professional development was available to them when they had a specific need. Even fewer teachers (37%) felt that professional development for technology was
directly relevant to their curriculum. Much like digital citizenship, this professional
development data suggests a difference between elementary and middle school teachers,
both regarding the content and also the professional development model that will work
best for them.

Focus group discussions with the elementary school teachers revealed an
appreciation for having a technology specialist in their building. The specialist was able
to partner with the teacher for planning, co-teaching and follow up conversations. While
no teachers specifically described the professional development relationship with the
specialist as “coaching,” they discussed “job-embedded” professional development and
also described many of the elements involved in a coaching cycle. This level of response
can be traced, not only to the presence of a specialist but to several professional
development initiatives that have happened at the elementary schools in the past two
years. As part of their English/Language Arts curriculum, the elementary schools have
created “lab classrooms” for structured teacher visits and job-embedded professional
growth conversations. Also, the introduction of the workshop approach to mathematics
instruction involved structured “coaching” sessions with math specialists. Through these
experiences, teachers at the elementary schools are in a much better position to
understand and welcome a job-embedded professional growth experience in their
classroom.

The middle school finds itself in a much different place, as far as professional
growth is concerned. The professional growth focus for the past two years has been on
grading practices and a transition to a standards-based report card. Grove has centered
much of its professional development time has on rewriting content standards and
refining the new report card. When discussing technology professional development, teachers acknowledged the singular focus on the report card and stated that they were ready for a shift in focus and an exploration of technology integration.

However, the model of P.D. that is more frequent at the middle school is a “sit and get” model, where a specialist or a colleague would show a teacher something that they may want to use in the classroom. No middle school teachers mentioned a job-embedded approach to professional learning. They looked at specialists in a very transactional way, where the specialist would provide a resource or a lesson for them, but would not be involved in the teaching of content or any observation and feedback of the classroom teacher. As professional development evolves at all grade levels in the Grove School District, leadership may need to differentiate between elementary and middle schools, until a common language and philosophy for job-embedded professional learning can evolve.

One common theme that arose at all grade levels was the need for more time. 45% of respondents on the survey did not agree that the district created sufficient time for technology professional development. In the focus group conversations, both groups felt that they wanted more time to learn from each other and the technology specialist. Particularly at the middle school level, teachers felt isolated in their classrooms and craved a way to learn more about what other teachers were doing. At the elementary level, teachers commented about the amount of work that the district expected of them, and their feelings that technology integration was often another thing for which they did not have time. Teachers were not opposed to learning more about technology integration, but they were looking for guidance on how to fit into their workload.
Collaborative time has been an issue in the Grove School District, and the district has recently formed a committee to examine some options for collaborative time, including the formation of PLCs (Professional Learning Communities) to bring teachers together around common issues of inquiry.

Survey data reveals a high level of satisfaction regarding the technical support of the one-to-one program. Overall, teachers felt that the technical support team was responsive to their issues and issues with student devices. Further, they felt that the technical support team helped them to have a better understanding of technical issues, which helped their comfort with the program. In the focus group conversations, no teachers mentioned technical support as an issue and commented that the support team was instrumental in helping to put management tools, like Apple Classroom in place for them. As the research indicates, technical support is a critical component for a successful one-to-one program, and teacher feedback confirms that this area of the Grove School District program is currently functioning well.

The role that leadership plays in directing and supporting a program is also present in the research, and over half of the surveyed Grove teachers felt that building and district leadership helped them to find ways to integrate technology. However, a sizeable number (42%) disagreed with the role that leadership played in helping them or was not sure how to assess their role. In the survey, teachers generally felt that leadership helped to provide professional development resources to them, and also that they modeled technology usage for them. During the focus group conversations, teachers did not have any specific negative comments about leaders but did express a desire for more
time to engage in professional collaboration, about which they felt leadership could advocate for them.

Another theme that surfaced during the elementary school focus group was curriculum design and content pacing. Some teachers were looking for more specific technology strands in the curriculum maps, to help them understand how to integrate technology into the core curriculum. Other teachers brought up the rigidity of the curriculum and the content block approach to delivering the curriculum. These teachers were looking for more freedom in how they covered the content during a school day. They felt that this freedom would help them integrate technology into the core curriculum and take a more inquiry-based approach to their teaching. These discussions were interesting and did highlight a recurring challenge for administration in the Grove School District, as they strive to create more clarity among teachers, regarding the curriculum and how to integrate various initiative, of which technology is only one.

**Possible Areas for Further Research**

The data that I collected for this program evaluation, while contributing to a rich story about Grove, also suggests several areas upon which my research could expand. Focus group interviews with teachers mentioned several online resources in which students collaborate, write and discuss (Schoology, Seesaw, KidBlog, Google Docs). These rich learning environments, however, were not accounted for in the classroom observation data. Additional research, incorporating an analysis of these emerging online learning environments would build an even richer vision of classroom technology integration at Grove.
Also, the story that the survey and focus group data told about professional
development at Grove is an area that would benefit from deeper exploration. Teachers
were positive about evolving their professional development model away from a
traditional structure to a more job-embedded coaching model. However, there are still
differences between teachers’ knowledge of coaching models. Also, administrative
voices were not collected in this program evaluation. A deeper dive into a professional
development vision would benefit from more interaction with curriculum leaders at
Grove.
SECTION FIVE: JUDGMENT AND RECOMMENDATIONS

Judgment(s)

Revisiting the primary question of my research, is there a relationship between how teachers perceive the benefits of technology in the classroom and their integration of technology into their instruction, it would appear that there is a connection between these two things. First, as I review survey data and focus group conversations, teachers had a generally positive vision of technology as an influence in the classroom, opening up new opportunities for both teaching and learning. Comparing these responses with observed behaviors in the classroom, students were utilizing technology frequently, and teachers were introducing assignments and resources that involved technology. The use of technology was seamless, and the comfort level with technology was evident.

The areas of discomfort that teachers expressed: discovering new practices and resources, and managing student behavior with technology was also evident in what I observed in the classroom. Applying the Technology Integration Matrix to my classroom observations, there appeared to be a hesitance to integrate the iPads into the higher levels of the matrix. Integration was still mostly teacher-centered and appeared less open regarding choice. In the focus group conversations, however, student choice was mentioned several times as an advantage to technology in the classroom. This statement, along with other professional learning conversations that we had during our focus groups led me to believe that there was potential for integration to move deeper along the matrix. However, additional professional development and collaborative planning are needed, in order to advance teacher confidence in student behavior management and digital
citizenship, as well as teacher knowledge about new resources and practices that they could bring to their one-to-one classroom.

The second research question that I considered asked what role does professional development play in the successful integration of technology in the classroom. It is my conclusion that, as my review of literature supports, professional development plays a critical role in successful technology integration. At all levels, teachers identified a need to learn about new resources and instructional practices, and they looked to various forms of professional development to address this need. Teachers at the elementary schools, where there are technology integration specialists in the building to meet with them, were much more open to the job-embedded coaching approach to professional growth. These teachers experienced an informal coaching cycle which included co-planning, co-teaching, solo teaching and a follow-up conversation with the specialist. They appreciated the specialist as an educator and felt that it was a pivotal component to their comfort with technology and the level to which they were integrating technology into their curriculum.

As I mentioned earlier, it is also important to note that the elementary schools have also gone through Language Arts and Mathematics curriculum reviews, which also involved one-on-one work with a specialist. This history has benefitted their understanding of professional development models and has helped their receptivity towards coaching in the area of technology.

The middle school teachers also felt a need for professional development to grow their technology integration. However, when I asked them about working with a coach or specialist, they did not even mention any experience with coaching in the classroom. In
their experience, specialists were resources which could provide them with ideas or tools but were not welcome in their rooms for planning or feedback.

To add some context to the middle school responses, technology integration specialists were once housed at the middle school but moved to the elementary schools because of teacher resistance towards working with them. The administration initially utilized them in a random and unclear approach, and coaching philosophy for the district had not yet been developed. It is my judgment that technology specialists could be a powerful presence at the middle school, but there may need to be some re-orientation regarding how they can work with teachers on planning and practice.

The approach to professional development that the middle school teachers most craved was a less formal collaboration with their colleagues. In the focus group discussion, middle school teachers shared positive comments about professional development days when teachers were able to present to one another, and there was a hope that opportunities for sharing would be offered as a PD option again.

Reviewing a secondary research question, how administrative leadership in technology affects integration in the classroom, teachers acknowledged in the survey data that administration set an example for staff in how they used technology, but they did not see leadership as clearly helping as instructional leaders. According to data, teachers felt supported by leadership, but they did not feel like leadership helped them integrate better or generate applications for technology in the classroom.

According to both survey data and focus group data, the largest area of support that leadership can provide for teachers is through the creation of time in the schedule or planning and professional development. Time concerns were cited repeatedly, as a
roadblock to technology integration and growth of the one-to-one program. For teachers, they saw the collaborative time as a chance to connect with specialists for planning or coaching, as well as a chance to meet with colleagues to learn how they were using technology in the classroom. Time was also discussed concerning the curriculum. Teachers felt pressure to cover content, to collect and analyze data and to develop a plan for technology integration. As one teacher commented, they are asked to do more and more, but nothing is taken off their plate. Teachers felt that the administration would be able to help them solve these issues and create opportunities through scheduling and programming.

My final related question asked how does the curriculum, including prescribed materials and pedagogy, impact technology integration in the classroom. I feel that the current structure of the curriculum did not have a significant impact on technology integration, aside from a desire for more professional development and planning time. As one respondent in the focus groups said, “I think the key word is, ‘Integrating.’ So it is not additional work, but that's something I feel like every year I want to be better at.” Teachers felt that the curriculum was excellent and rigorous enough for the students, and everyone felt that technology had great potential to help deliver the curriculum to students.

In the focus group conversations, several teachers mentioned that they did not feel undue pressure to integrate technology, that leadership had not set specific benchmark scores or evaluative areas for the one-to-one program. Teachers did say they felt that technology integration was expected and encouraged, but not strictly evaluated. I feel that this point accounts for the comfort people had with technology integration and the
If Grove evaluated the one-to-one program against reading or math scores, it would create additional pressures for teachers. This situation has been a double-edged sword for the Grove School District. The approach has created much more positive attitudes towards the one-to-one program, but it also has not created the urgency to develop an approach to technology integration. Over time, perhaps this approach will result in a more enduring program.

**Recommendation(s)**

Based on the findings of the One-To-One Teachers Survey and focus groups, several strategies could be implemented to maintain a positive attitude towards the technology program and further the depth of integration that teachers undertake in the classroom. The data collected in the area of professional development suggests many changes that could be made for the benefit of teaching and learning in the Grove School District. All of the teachers that were interviewed for this evaluation expressed a preference for a job-embedded PD model for technology, which allowed them to learn while doing and see the technology in context, rather than as a “sit and get” model. I recommend that the district work to develop a structured instructional coaching model for staff, involving planning, co-teaching and ongoing conversations around teacher practice. This approach to professional learning would enable teachers to explore technology and learn new resources and practices within their classroom setting and with the support of a specialist.

A challenge to implementing a job-embedded professional development approach in The Grove School District is a lack of clarity among staff, regarding what a coaching program is. A top priority in serving this goal will be to establish a shared vision,
practice, and language around instructional coaching. As I discussed in my findings, teachers at the Middle School still look at the technology specialists from a more transactional lens, as providers of resources and tools for the teacher to use when they need them. At the elementary school, initiatives related to the math and ELA curricula have oriented the teachers to a job-embedded coaching model, and they are more familiar with utilizing a specialist as an ongoing professional partnership. If coaching is going to flourish in The Grove District, this vision of coaching needs to be understood by teachers at every level.

In his foundational research on the topic of coaching, Jim Knight has stressed that the building principal is critical to the success of the program. As the building instructional leader, the principal can help the coaches understand the building priorities and areas of focus. From this input, the technology specialist can focus their efforts on integration that is relevant to the building goals and therefore more coherent to teachers. This approach has the added benefit of clarifying the building leaders’ understanding of technology integration and support for the one-to-one program.

Currently, the Grove School District employs two certified instructional technology specialists, to cover three schools. The specialists reside at the elementary schools, which explains their success with teachers in those buildings, as opposed to the middle school. While the specialists work at all three schools, they have not established the relationships at the middle school that they have at the other schools. In order to increase the success of instructional coaching at all schools, I recommend the hiring of a third technology integration coach, who will focus on teacher in the middle school. I feel that this person will help to successfully establish a coaching program at the middle
school and orient teachers to the coaching approach to job-embedded professional development.

Finally, it would be helpful for teachers if they gained some clarity regarding technology in the Grove School District. While teachers were very positive about technology and the one-to-one program, they did feel like leadership did not provide much direction about tech integration, or what the expectations were for the program. It is my recommendation that a clearer vision for the program is presented to staff, and also clearer integration points should be developed in the core curriculum maps. These integration points could assist technology specialists as they work with teachers in professional development and also provide leadership with some specific areas of focus as they observe the one-to-one program and evaluate its effectiveness.

Another area of focus that emerged from my research was the role administration leadership plays in the one-to-one program. While teachers were generally positive towards building and district leadership, feedback in the survey data and focus groups expressed a desire for more time to be made available for teacher collaboration and job-embedded professional development. My recommendation in this area would be for the Grove School District to establish a time committee, made up of teachers and administrators, to review the current schedule and develop a strategy to create more common planning time for teachers. This process would involve a review of instructional blocks, beginning and end times for the school day, and current institute days in the district. The desired outcome of this process would be the identification of regular planning time for teachers, where they can collaborate on curriculum and practice.
Another outcome would be an accountability strategy, so leadership can provide some structure and desired outcomes for this time.

The Grove School District is currently investigating the possible establishment of professional learning communities (PLCs) in the district, as a way of facilitating collaborative time between educators. A model like this could be a powerful use of any collaborative time that the time committee identifies since it would introduce a common structure and language to the collaborative environment. As teachers seek to learn more about technology integration and deepen their integration of technology in the classroom, a PLC model may be a terrific venue for teachers to help one another, as well as utilize our specialists in their learning.

Another item that teachers mentioned in the focus groups was the creation of some practice by which teachers could observe each other’s classrooms more easily and regularly. A middle school teacher in the focus group referenced a “pineapple chart” which teachers would post as an invitation to colleagues who wanted to come in and observe their classrooms. An idea such as this would be a way for teachers to become aware of new practices and tools, but also a way for teachers to see each other through a different lens and help each other grow their practice. The elementary schools have established four “lab classrooms” as a showcase of ELA instructional practices. The lab classroom approach has a deeper structure than what the middle school suggested, but is similar in spirit, inviting colleagues to come in and observe the classroom in action. I recommend that the Grove School District investigate this practice further, either implementing the pineapple chart approach or possibly expanding the lab classroom to include technology integration and perhaps math workshop instruction. Not only is this a
robust professional learning opportunity, but it would have the additional benefit of shifting the culture of the district, towards a more collaborative culture that is comfortable sharing what they are doing and interested in helping each other deepen their practice.

In the elementary school focus group, one teacher observed that both school principals are different from the principal when the one-to-one program started. While both principals have been supportive of the one-to-one program, my recommendation is that the district develops a regular steering committee, to involve building leadership in the program more deeply. Even as an annual conversation, this would be an opportunity for building leadership to identify successes and challenges in the program, and establish a focus for the coming year. This focus may intersect with the curricular goals, and can also help the technology integration specialists in their professional development work with teachers. If nothing else, it establishes a common language for the program that will be shared with teachers.

Finally, this program evaluation was an opportunity to review how The Grove School District has communicated with teachers during the one-to-one program. Many changes have happened during the time this program has been in place: from changes in building and district leadership to the development of new curriculum. This program evaluation represented the first time that teachers were surveyed and engaged in the program. The feedback that I received from teachers was encouraging and humbling. While teachers were honest in assessing the challenges that they saw with the program and their desires for more collaborative time and professional development, they were also excited about the program and the potential that they saw for their students. At the
end of the focus groups, teachers were thankful for the opportunity to share and mentioned their willingness to participate in future groups. My biggest takeaway from this program evaluation is a desire to engage teachers more frequently about the one-to-one program, to give them a chance to voice their observations and to learn from what they see in the classroom every day. It is through regular conversation and feedback that we can all grow as educators and as leaders.
REFERENCES


Knight, C. L. (2012). *Roadblocks to integrating technology into classroom instruction*.


APPENDIX A: RECRUITMENT EMAIL FOR FOCUS GROUPS

Date:

Subject: Doctoral Research Project Participation

Dear ____________:

I wanted to touch base with you about participation in a research project that I am undertaking. As you may know, I am currently in a doctoral program at National Louis University. As part of this program, I am conducting research study focused on the one-to-one program in our district, and the role that leadership plays in a technology program. As part of my study, I will be conducting semi-structured focus-group interviews with teachers. I would like to invite you to participate in this process. Participation in this study is completely voluntary and can be discontinued at any time without penalty or bias. All responses will be anonymously reported and no identities will be revealed.

If you are interested in participating in my work, please respond to this email, and we can work to schedule a convenient time and location to meet. The focus group will take approximately 45-60 minutes. Please, also see the attached informed consent, which contains additional information for you to review, should you choose to participate in my research. Thank you so much for your help and consideration.

Andrew Kohl
APPENDIX B: INFORMED CONSENT

My name is Andrew Kohl, and I am a doctoral student at National Louis University. I am inviting you to participate in the study, “Success Factors for Impactful Technology Integration” occurring from February, 2017 to April, 2017. The purpose of this study is to improve understanding of the impact that leadership decisions have on how a one-to-one program is received and utilized by staff. This form outlines the purpose of the study and provides a description of your involvement and rights as a participant in the interview portion of this research project. Participation in this study will include:

- An interview scheduled at your convenience in the fall of 2016
  - Focus groups will last approximately 45-60 minutes and include 10 questions related to instructional technology and functioning of our one-to-one program.
  - Interviews will be audio recorded for data analysis purposes. However, your identity will remain anonymous. The responses given during the interview will be coded as “responder 1”, “responder 2”, etc.

Your participation is voluntary and can be discontinued at any time without penalty and without bias. The results of this study may be published or otherwise reported at conferences, and employed to inform practices at Grove School District, but participants’ identities will in no way be revealed. All audio-recordings and transcripts will be secured on the researcher's password-protected computer and will be deleted at the conclusion of the study.

There are no anticipated risks, greater than those encountered in daily life. Further, the information gained from this study could be useful to our school district and other districts looking to evaluate their programs.

Upon request, you may receive summary results from this study and copies of any publications that may occur. Please email the researcher, Andrew Kohl, akohl1@my.nl.edu to request results from this study.

In the event you have questions or require any additional information, please contact the researcher, Andrew Kohl at akohl1@my.nl.edu or 312-623-3352, Gloria McDaniel Hall at gmcdanielhall@nl.edu, or Shaunti Knauth, Chair of NLU’s Institutional Research Review Board, shaunti.knauth@nl.edu, 312-261-3526

By signing below, you are providing consent to participate in this research project conducted by Andrew Kohl, doctoral student, at National Louis University, Chicago.
Thank you for your consideration.

_________________________  ________________________
Participant’s Signature    Date

_________________________  ________________________
Researcher’s Signature     Date
APPENDIX C: FOCUS GROUP PROTOCOL

Thank you for taking the time to meet with me. The purpose of this focus group is to add some context and detail to the collected results of the survey I sent out. I hope to gain ideas for improving the planning, implementation, support and evaluation of our one-to-one program, as well as of technology integration in general. Before we start, I would like to review a few ground rules for the discussion.

a. I am going to ask you several questions; we do not have to go in any particular order but I would like everyone to take part in the conversation. I ask that only one person speak at a time.
b. Feel free to consider this a discussion, not an interview, and respond to what others are saying. Disagreements and agreements are fine. I’m interested in your opinions and whatever you have to say is valuable. There are no right or wrong answers. I am just asking for your opinions based on your own personal experience. I’m here to learn from you.
c. Don’t worry about having a different opinion from someone else.
d. Do not feel that you need to answer every question.
e. I am recording the discussion today and also taking notes because I don’t want to miss any of your comments. I will treat your answers and my notes as confidential. I will not include your names or any other information that could identify you in any reports that I write. I will destroy the notes and recordings after I complete my evaluation. In the meantime, the recordings and notes will be kept on my password-protected hard drive.
f. Finally, this discussion is going to take about 45 minutes. Does anyone have any questions before we start?
APPENDIX D: FOCUS GROUP QUESTIONS

(Use of Technology) What are some student uses of technology that you have observed and felt were powerful opportunities for your classroom?

(Technology Integration) What roadblocks do you feel still exist in terms of technology use in the classroom?

(Professional Learning) What professional development activities do you feel would grow technology integration in your practice and increase your interest in technology as a learning tool?

(Support) What are some actions that leadership (principals, district) can take to support technology integration in your school and increase capacity for innovation?

(Support) What additional resources (e.g. time, materials, staff) are needed to improve the one-to-one program and technology integration in your school?

(Professional Learning) How do you feel the district’s professional development activities impact your use of technology in the classroom?

(Technology Integration) We have gone through a lot of change in our district, in terms of curricula and professional development. How do you fit technology into our current curriculum and your professional practice?

(Additional Question) Are there any other issues related to technology integration and the one-to-one program that we haven’t touched upon that you would like to discuss? Is there anything else that you feel I should consider when I do my evaluation of our one-to-one program?
APPENDIX E: TEACHER QUESTIONNAIRE

You are being asked to participate in the following survey, regarding instructional technology and our one-to-one program. Thank you so much for your time and your valuable input. This survey is voluntary and anonymous. Please select one answer for each question.

Technology Integration

I use some form of technology in my classroom instruction each day.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Technology empowers teachers and students with a wide variety of resources for teaching and learning.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

An experiential-focused curriculum greatly enhances instruction with technology.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

A technology-integrated curriculum promotes better classroom instruction.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

When technology is a part of instruction it increases interaction in the classroom.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Many of the learning experiences in my classroom require students to use some form of technology.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Current curriculum requirements make it difficult to implement new ideas like technology in classroom instruction.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Technology in instruction helps teachers to reach students with diverse learning styles.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

I do not get feedback from my administrator when I use technology in my classroom instruction.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

I use technology to prepare my own instructional materials.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

I am comfortable evaluating technology-based curricula materials.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree
The rigidity of the curriculum makes it difficult to implement technology into my instruction.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

I assign my students projects and homework that requires the use of technology.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Technology in instruction does not enrich students’ knowledge.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Technology helps teachers to provide instruction through different delivery modes.
( ) Strongly Agree  ( ) Agree  ( ) Not Sure  ( ) Disagree  ( ) Strongly Disagree

Use of Technology

How often do you incorporate technology with the following classroom activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>Seldom</th>
<th>Occasionally</th>
<th>Almost Daily</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture / Presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Discussion</td>
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<tr>
<td>Drill / Practice Assignments</td>
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<tr>
<td>In-Class Research</td>
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<tr>
<td>In-Class Reading</td>
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<tr>
<td>In-Class Writing</td>
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<td></td>
<td></td>
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<tr>
<td>Projects involving problem solving</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Projects involving data analysis</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creating original products (video, music, visual presentation)</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
How often do you observe students using their iPads for the following activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>Seldom</th>
<th>Occasionally</th>
<th>Almost Daily</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note Taking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File Storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework Completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Class Assignments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Reading Novels (for school or pleasure)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Creating Video</td>
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<td></td>
<td></td>
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<tr>
<td>Creating Music</td>
<td></td>
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</tbody>
</table>

Technology Support

I feel that I am competent in the use of technology hardware and software.
( ) Strongly Agree   ( ) Agree    ( ) Not Sure   ( ) Disagree  ( ) Strongly Disagree

It is important that technology support staff understand teaching and curriculum concerns.
( ) Strongly Agree   ( ) Agree    ( ) Not Sure   ( ) Disagree  ( ) Strongly Disagree

Technology support is quickly accessible for computer related issues, such as hardware and software.
( ) Strongly Agree   ( ) Agree    ( ) Not Sure   ( ) Disagree  ( ) Strongly Disagree

Technology is available on a consistent basis for me to use as part of classroom instruction.
( ) Strongly Agree   ( ) Agree    ( ) Not Sure   ( ) Disagree  ( ) Strongly Disagree

Students have frequent issues accessing technology resources for classroom activities.
( ) Strongly Agree   ( ) Agree    ( ) Not Sure   ( ) Disagree  ( ) Strongly Disagree

Technology support staff try to help me understand about any technology issues that I might encounter.
Technology Professional Growth

Administration assists me in finding ways to integrate technology into my classroom instruction.

Administration provides teachers with training in technology and follow-up support with integrating technology into classroom instruction.

Administration use some form of technology when conducting presentations, workshops or meetings.

Technology professional development takes place when teachers have a specific need.

Technology professional development resources are readily available.

Technology staff are available to support my integration needs.

Curriculum support is an important part of integrating technology into my instruction.

Technology professional development addresses issues that are directly relevant to our curriculum.

The District has created time for technology professional development offerings.

Teachers are included when designing professional development activities.

Time is made available to work with others to develop new instructional strategies with technology.

It is important to feel that it is safe to experiment and make mistakes with technology.
## APPENDIX F: LEI AND ZHOU’S OBSERVATION MATRIX

<table>
<thead>
<tr>
<th></th>
<th>ELA (23)</th>
<th>Math (22)</th>
<th>Science (20)</th>
<th>Soc. Studies (20)</th>
<th>LMC (34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology used for specific tasks</td>
<td></td>
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<tr>
<td>Technology used for communication.</td>
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<tr>
<td>Technology used for expression.</td>
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</tr>
<tr>
<td>Technology used for exploration</td>
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</tbody>
</table>
### APPENDIX G: THE TECHNOLOGY INTEGRATION MATRIX (TIM) 2018

**FLORIDA CENTER FOR INSTRUCTIONAL TECHNOLOGY**

<table>
<thead>
<tr>
<th>Characteristic of the Learning Environment</th>
<th>Levels of Technology Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVE LEARNING</strong></td>
<td><strong>ENTRY LEVEL</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ADOPTION LEVEL</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ADAPTATION LEVEL</strong></td>
</tr>
<tr>
<td></td>
<td><strong>INFUSION LEVEL</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TRANSFORMATION LEVEL</strong></td>
</tr>
</tbody>
</table>

| **COLLABORATIVE LEARNING** | **ENTRY LEVEL** | Students use technology tools to collaborate with others rather than working individually at all times. |
| | **ADOPTION LEVEL** | Collaborative use of tools in conventional ways. |
| | **ADAPTATION LEVEL** | Collaborative use of tools; some student choice and exploration. |
| | **INFUSION LEVEL** | Collaborative use of tools; regular use for collaboration. |
| | **TRANSFORMATION LEVEL** | Collaborative transformation; collaboration with peers and outside resources in ways not possible without technology. |

| **CONSTRUCTIVE LEARNING** | **ENTRY LEVEL** | Students use technology tools to connect new information to their prior knowledge rather than to passively receive information. |
| | **ADOPTION LEVEL** | Constructive adoption; guided, conventional use for building knowledge. |
| | **ADAPTATION LEVEL** | Constructive adoption; independent use for building knowledge; some student choice and exploration. |
| | **INFUSION LEVEL** | Constructive infusion; choice and regular use for building knowledge. |
| | **TRANSFORMATION LEVEL** | Constructive transformation; extensive and unconventional use of technology tools to build knowledge. |

| **AUTHENTIC LEARNING** | **ENTRY LEVEL** | Authentic entry; use unrelated to the world outside of the instructional setting. |
| | **ADOPTION LEVEL** | Authentic adoption; guided use in activities with some meaningful context. |
| | **ADAPTATION LEVEL** | Authentic adoption; independent use in activities connected to students' lives; some student choice and exploration. |
| | **INFUSION LEVEL** | Authentic infusion; choice of tools and regular use in meaningful activities. |
| | **TRANSFORMATION LEVEL** | Authentic transformation; innovative use for higher order learning activities in a local or global context. |

| **GOAL-DIRECTED LEARNING** | **ENTRY LEVEL** | Goal-directed entry; step-by-step task monitoring. |
| | **ADOPTION LEVEL** | Goal-directed adoption; conventional and procedural use of tools to plan or monitor. |
| | **ADAPTATION LEVEL** | Goal-directed adaptation; purposeful use of tools to plan and monitor; some student choice and exploration. |
| | **INFUSION LEVEL** | Goal-directed infusion; flexible and seamless use of tools to plan and monitor. |
| | **TRANSFORMATION LEVEL** | Goal-directed transformation; extensive and higher order use of tools to plan and monitor. |