

ABSTRACT OF CAPSTONE

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The Graduate School
Morehead State University

April 23, 2018

ONE-TO-ONE OR ONE-TO-NONE?
A LOOK INSIDE FROM A CERTAIN POINT OF VIEW

Abstract of Capstone

A capstone submitted in partial fulfillment of the
Requirements for the degree of Doctor of Education in the
College of Education
At Morehead State University

By

Sean R. Jackson

Tollesboro, Kentucky

Committee Chair: John H. Curry, Assistant Professor

Morehead, Kentucky

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Students and teachers at Mason County High School changed their instructional environment in the Fall of 2012. Since that time, a 1:1 device environment has been present in the school and has yielded shifts in what is thought of as ‘learning.’ Through it all, the stories and first-hand experiences of the program manager provide the best contextual evidence of the lessons learned through implementation and serve as evidence of what is needed when beginning to make this shift in an educational environment. What has resulted is a collection of stories, along with reflections on the program, that should serve not as an exact formula to follow for program creation, but as conversation points for those beginning their journey into device integration.

KEYWORDS: One-to-One, Integration, Reflection, Instruction

Candidate Signature

Date

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DEDICATION

This capstone is dedicated to my parents who have always made sure that I knew I had their love and support. To Rebecca, my wife whom I love and has endured on this journey with me. To my three daughters Samantha, Annabel and Olivia who are my inspiration on a daily basis. Finally, to the members of the 4th Dimension Group, who helped put me on a path in life I could be proud of. I have no way of ever repaying all of these individuals, but I dedicate my hard work to them, in the hopes that it will serve as an example of the power that their faith in me has had.

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Finally, to Rebecca Jackson, my wife and fellow educator who bought me the iPod Touch in 2007 that began this whole journey for me. Who would have ever thought a small gift would change my life?

TABLE OF CONTENTS

	Page
Executive Summary	11
What is the core of the capstone?	11
Who is the capstone meant to impact?	13
Why is this capstone needed?	14
Why am I the person to write this capstone?	29
Reflections	30
Leadership.....	31
Reference List	32
Capstone Project	43
Vita.....	102

EXECUTIVE SUMMARY

What is the core of this capstone?

The core of this capstone is a collection of stories, in book format, relating lessons learned from working within a 1:1 device environment for six years. Building upon the discussion of educational device integration found in other research and capstone projects (Belcher, 2014; Culén & Gasparini, 2011; Molnar, 1997; Warschauer, 2005) this collection incorporates first-hand experiences, reflections and realizations about those experiences as well as suggested practices for leaders to follow in order to implement similar programs in their environments. Following each first-hand account are recommendations for further reading that apply to the topics covered.

Concentrating on sustainability and the six years of collected experiential information, this book could possibly provide a first-of-its-kind look into what it means to lead in a device-rich school. The anecdotal evidence presented is one of the first examples of scholarly writing on this topic from this point of view. The chief focus lies in the areas of leading, instructional support and organizational change that develop from a concentrated effort to direct instructional activities to achieve organizational objectives.

With the significant monetary investment present, a device one-to-one is heavily scrutinized and pressure mounts for leaders to effectively implement the systems and provide evidence of their positive effect on the learning environment. The sustainability of such systems lies within the appropriate level of administrative

oversight and managerial responsibility. However, while the recognized monetary investment of implementation is significant, it is recognized as a surmountable barrier (Horn, Gu, & Evans, 2015), necessary to address the need for educational program change (Silvernail & Lane, 2004). The use of technology for use in learning and work applications is paramount to the success of students beyond their school career (Bell, 2010).

Within the context of this capstone, the focus is not solely on the rollout or implementation of a 1:1 environment Mason County High School, but the ongoing shift in the instructional environment that should take shape past the inception period. This is contrary to similar pieces of research or case study, which show on the effect of such programs in the short term (Belcher, 2014; Branch, 2014; Hanson, 2015). The experiences related through this capstone were the result of being present in the program from inception to its current state at the time of writing. Exploration of these experiences, accompanied with the lessons learn from them, provides a conceptual framework for instructional change that takes place gradually during the continuation of this type of program (Weston & Bain, 2010).

Through intensive planning and focused initiatives, innovative and effective learning environments can be built within the existing school framework (Barbour et al., 2011; Cavanaugh, Barbour, & Clark, 2009). While the information presented in this capstone will not show focused initiatives or attempt to tell anyone exactly how to develop or execute a 1:1 program in their school, it should provide a unique look into what it means to lead and support a device-rich school.

The collected stories inform readers on the following topics found to affect school technology programs:

1. Transformational Leadership
2. Professional Development
3. Systemic change

The personal accounts contextualize these themes, while incorporated research accompanies them to provide the basis for their consideration and review.

Who is the capstone meant to impact?

While not highlighting the Mason County as an exemplar for institutions to mimic, the first-hand accounts of specific events, combined with lessons learned and supporting research hope to inform a community of K-12 education leaders, educational technology integration specialists (TIS) and researchers specifically interested in device 1:1 programs. Six years of first-hand accounts will provide context for leaders and TISs to guide and improve their practice in the areas of device management, classroom instruction using technology and changing the school dynamic to focus on maximizing instructional outcomes for the 21st Century learner. It is hoped that educational change leaders and administrators can take the accounts from this collection and closely identify with the themes which emerge. Researchers may find that the accounts and corresponding lessons are similar to those experienced in other 1:1 programs or may be inspired to further study such programs. From my six years of experience implementing, managing and teaching in a 1:1 high school, this project was developed to assist future change efforts and assist other educators in helping to change the wider school environment.

The narrative format is designed to guide current leaders already in device-rich environments as well as individuals seeking to improve instructional practice for the 21st Century learner. Beyond the context of the Mason County 1:1, and with the hope to enable a wider audience to incorporate some of the information into their existing programs and systems, suggested items for further reading are presented.

Why is this capstone needed?

Questions regarding the effectiveness of technology-based learning have guided researchers for over a decade (Barth, Hull, & St Andrie, 2012; El Mansour & Mupinga, 2007; Eryilmaz, 2015; Gangaram, 2015; Hollands, 2011; Kazu & Demirkol, 2014; Lonn & Teasley, 2009; Molnar, 1997; Nagel, 2009; Oliver & Trigwell, 2005). Its pervasiveness in the ecosystem of higher education (Demski, 2010; Dziuban, Moskal, & Hartman, 2005; El Mansour & Mupinga, 2007; Moskal, Dziuban, & Hartman, 2013; Nagel, 2009) has caused the K-12 environment to develop hybrid and online systems of instruction for their own students (Barth et al., 2012; Basham, Smith, Greer, & Marino, 2013; Cavanaugh et al., 2009; DeGuzman, 2008; Horn et al., 2015; Kazu & Demirkol, 2014). However, the seeming abundance of research on the topic of educational technology in learning has still not answered the fundamental question on everyone's mind; does it actually work? And that is where researchers begin to disagree.

Cuban (1993) pointed out the fact that computers changed little about the way schools handled their daily business, despite their continued emergence into the field, or prevalence in the business world. This was reiterated a decade later when he again

visited the concept of computers in the classroom and found that the perceptions and uses were almost identical to the ones examined previously (2009). Overall, Cuban's analysis was that the system of education would not become 'innovative' solely through the introduction of devices or increased technological capacity by the institutions. Education was not going to change drastically simply through the addition of these devices. This criticism of school technology programs has been countered (Livingston, 2006; Silvernail & Lane, 2004; Watson & Gemin, 2009), supported (Gasparini & Culen, 2013; Lowther, Ross, & Morrison, 2003), and contextualized (Ertmer, 1999; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Weston & Bain, 2010) over the years, while devices still permeate through the framework of the institutions of education. The addition of devices is an avenue toward change, but is not sufficient in providing lasting change (Joseph & Reigeluth, 2010).

What is consistently seen through the research is that the medium of the instruction has little impact on student achievement (Cuban, 2009; Gangaram, 2015; Hollands, 2011; Rice, 2006) even in intensive intervention-based systems which provided additional support to students in online or blended classes (DeGuzman, 2008). Deguzman implemented such support systems into a high school Biology course. It was concluded that while the quantitative data (student perceptions) was more positive in student feelings toward the learning in the online or blended environments, the quantitative reports from pre- to post-test phases saw no significant difference in the groups. Hollands (2011) and Gangaram (2015), additionally, report

there is no research that has conclusively determined that online or blended courses are more effective than traditional models and that there is no answer, currently, to the question of effectiveness. Just as the discussion of effectiveness drove post-secondary institutions to begin looking to successful programs to emulate, the same is being done for K-12.

Viewing the research as a means to identify the themes associated with instructional technology programs, there are three areas that emerge as the primary focus. Transformational leadership, professional development, and the achievement of systemic change serve as the pivotal topics on this subject.

Transformational Leadership

Building on the discussion first presented by Burns (1978), Bass and Avolio (1994) developed the formal transformational leadership model. Burns (1978) identified that rather than merely exchange rewards and benefits for meeting the defined needs of the organization (transactional leadership), the transformational leader develops the constituents' capacity for effectiveness, and the ability for the system to exist even in new environments or allow for diffusion into other realms (by empowering others to take on leadership roles).

Byrom and Bingham (2001), highlight that the relationship between leadership and effective technology implementation is not a coincidence. That is, the leaders are the elements that enable a program (as well as the teachers and students) to successfully change practice and pedagogy (Afshari, Bakar, Wong, Samah, & Fooi, 2008; Fullan & Stiegelbauer, 1991; Wilmore & Betz, 2000). The question then

becomes what leadership style is best suited to help teachers cope with the demands of a technological and pedagogical change? Northouse (2015) believes that the answer is the transformational leadership model because of its ability to change individuals while changing an institution.

In a device one-to-one (whether it be laptops or tablets) there are considerable challenges that must be faced when attempting implementation. Ertmer (1999) highlights that there are 2 types of barriers to change in relation to technology implementations: first-order (adjustments to current practices) and second-order (fundamental changes to beliefs and practices) (p. 48). First-order barriers can be overcome by the widespread dispersal of additional resources or technology-specific training, while second-order barriers can only be overcome through the changing of pedagogical approaches and the reimagining of what constitutes learning (Fullan & Stiegelbauer, 1991). The first-order barriers pose a significant threat to integrating technology in the classroom and are usually the most addressed by pre-implementation efforts (Ertmer, 2005; Ertmer et al., 2012; O'Mahony, 2004). And of these, access and skills are the means by which transformational leaders can begin changing their environments.

First-Order Barriers

Access. In his book, *The Digital Divide*, Everett Rogers (2001) highlights the economic and social inequality that exists in regard to access to and benefits from information and communication technology (ICT). Today, 'digital divide' is not simply a term to highlight the differences in access to devices but is more closely

associated with the issues of how quickly one is able to access information (bandwidth) and how effective the users of the ICT (skills). And this term does not simply relate to student populations. Considering educational institutions with high-poverty populations, the faculty is many times as divided from ICT access and skills as their students (Norris, 2001; Warschauer, 2004).

When we began pursuing our 1:1 at Mason County High School, our student population consisted of 62% free-reduced lunch status with 75% of our students reporting that they did not have access to the internet at home (Belcher, 2014; Curry, Jackson, & Kallas, 2017). With a student enrollment of about 850, the student-to-computer ratio was approximately 8:1. This was the chief problem the initiative was aimed at solving. Considering the pervasive presence technology tools and systems have in business and higher education (Dziuban et al., 2005; Kasraie & Kasraie, 2010), it seemed appropriate that providing access to technology take precedence for a small learning community. A school-financed 1:1 was necessary, as opposed to a 'bring your own device' (BYOD) program because of our desire to provide equal access to devices for all students and not isolate groups of lower socio-economic students. However, one may argue that the 'equality' was lacking due to the fact that it did not account for or address the issue of internet access in the home for students. This is problematic because of the iPad's dependence upon internet-connectivity for use. While in-home internet was not specifically addressed within the program's design, the school worked with organizations within the community to assist in providing free internet access to visitors and customers. The YMCA, public library

and various restaurant locations all enhanced their networks to allow students to use the devices on site after leaving school grounds.

Providing teachers with the devices was just as necessary as providing them to the students. Bauer and Kenton (2005) explain that even the most technology-literate teachers are often not able to adequately integrate technology into their classrooms because of insufficient resources and access to equipment. The Mason County 1:1 provided teachers with the same devices as the students making it possible for them to teach with the same tools that the students were using to learn.

The introductory training was designed not so much as a means to change pedagogy, but as a beginning to implementing the tool's use in the classroom as a replacement for current practices. Because of this focus, the accessibility of tools was managed effectively during the pre-implementation period. However, the skill barrier presented numerous challenges as teachers desired more technical training on troubleshooting issues with the devices or on their adaptation for specific activities. Teachers reported an inability to use the devices for secure testing, the lack of sufficient supporting materials that would allow them to attempt more technology-rich activities and the need for more time during their school day to create their own digital lessons and activities. All of these requests could have been more directly addressed through skill-development training for the educators.

Skills. Today, technology integration is an expectation rather than an innovation (Holcomb, 2009). What seemed innovative in practice just 6 years ago when beginning our 1:1 journey, is now commonplace in many public schools around

the nation. Yet, there is still a large gap between the expectation and the preparation for teaching in this type of environment (Flanagan & Jacobsen, 2003). Teachers entering the field have neither the training on nor the technical skill required to manage and teach technology-integrated classrooms (Brzycki & Dudt, 2005). The expectation to use and proficiently adapt tools with which they have no training is a fundamental flaw within this demand for more technology competency. A self-efficacy study of preservice teachers by Kiili, Kauppinen, Coiro, and Utraiainen (2016) concluded that the use of embedded technology tasks within the preservice teacher curriculum promoted confidence. Rather than acting as passive consumers, teachers created tasks that assisted students in curating and producing digital information.

Schools and districts do not have the luxury of modifying preservice training programs. We depend heavily on the ability to provide training that can reach an audience of broad ability levels and needs. When training needs are not met, transformation and change will not take place. It is up to leaders to prioritize the development of skills before asking for drastic changes to instruction and pedagogy.

Second-Order Barriers

Ertmer (1999) poses that the level of technology integration, “is impossible to determine...by counting the number of computers available” (p. 49). Rather, it should be determined through the evaluation of how the technology has facilitated new ways for teaching and learning (p. 50). While these barriers are related to teacher’s perceptions and are an internal barrier to integration, some indication is given to the way training is directly related to these barriers. Jahnke, Bergström, Mårell-Olsson,

Häll, and Kumar (2017) found in their investigated iPad 1:1 classrooms the level of teacher training affected future changes in pedagogy and student learning activities. Brzycki and Dudt (2005) examined the effect of instructional technology training in preservice teaching program candidates and found that their perceptions on what constituted learning was affected through the continued support and incorporation of technology in their assignments. Even expanded research by Ertmer (2005) concluded that by incorporating personal experiences learning with technology and professional learning communities of support, teacher pedagogy could be influenced to incorporate more technology-integrated lessons. So, if training can yield a shift in the pedagogical beliefs of both pre-service and in-service teachers, why is the focus solely on access and technology usage skills when implementing technology programs?

My answer would be that many of today's educational leaders are unequipped to foresee the training needs in new technology programs. These leaders were trained and began teaching in an antiquated system where the new technologies were either not yet available or had not found their way into the hands of students. For that matter, more experienced teachers have traditionally been found to be less ready to incorporate technology for learning (Buabeng-Andoh, 2012) but are more confident in their ability to adapt new technology to students' learning needs when given the proper training and support structures (Lau & Sim, 2008). What this should tell us is that the experienced teacher has the ability to adjust their practices when they perceive they will be successful in their approach.

In context, first-order barriers can be broken through transformational leadership practices (instilling vision, purpose and distributive leadership) (Bass & Avolio, 1994; Turner, 2014). These transformational leadership actions provide the means to change, but alone are insufficient to exact the change necessary to elicit new practices (Jung, Chow, & Wu, 2003). For change to transcend the second-order barriers, a planned program of instructional action must take place which allows stakeholders to create new definitions for the environment that were not possible prior to the introduction of the technology (Ertmer, 1999; Lowther et al., 2003). When these barriers are overcome, the entire system can begin experience change that allows the paradigm of education to be one that is future-ready.

Professional Development

The leader begins as a navigator for change by outlining the program goals and plotting the course by which to achieve those goals through a planned program of action (Kotter, 1995; Muir, Knezek, & Christensen, 2004). Despite all of these findings focused on leadership, the lack of sufficient information regarding sustainability of 1:1 programs leaves many questions unanswered regarding how to best address the training components to create lasting change in a school environment. Ornit, Tal, and Michal (2016) suggest that the field of research is scarce when attempting to gain information about sustainability of a 1:1 learning environment past the first few years of implementation. Some such efforts have experienced a decrease in enthusiasm by teachers and students after the novelty of the devices has worn off (Grant et al., 2015; Lowther et al., 2003) and others have even

abandoned the programs due to the failure to achieve desired goals (Hu, 2007). But when studying programs in a longitudinal way, researchers may find that the number of years in a program has a direct correlation to increased student efficacy and attitude toward learning with technology (Ornit et al., 2016).

Considering the amount of time and money institutions spend on 1:1 programs it would seem unwise to completely abandon them after only a brief period. The question is not whether to continue when experiencing hardships but how to best prepare for success over the long-term. If instruction is at the core of educational change initiatives, the effect will be better equipped teachers and higher achieving students (Branch, 2014; Flanagan & Jacobsen, 2003; Hooper & Rieber, 1995). I realize that a 1:1 program is not strictly a consideration of the instructional components. There are numerous logistic and managerial considerations to account for when planning and implementing technology integration projects (Belcher, 2014; Gerger, 2014; Topper & Lancaster, 2013; Valiente, 2010). Along with that, the goals of school 1:1 programs must incorporate 21st Century learning skills for faculty and students, effective use of technology for learning, a move to decrease the digital divide among constituents and innovative approaches to pedagogy (Balanskat, Bannister, Hertz, Sigilló, & Vuorikari, 2013; Lowther, Inan, Ross, & Strahl, 2012; Ornit et al., 2016). Ideally, this is achieved when instruction is used as the focus for the program's design.

Is there an instructional design model that can be used to support both the instructional components and still incorporate the logistical elements necessary for

the educational technology program to function? The instructional design framework found in Merrill's *First Principles of Instruction* (2002a) provides this type of flexibility and can be adapted for programmatic design purposes.

Why the *First Principles* and What are They?

Merrill (2002a) classifies his *First Principles of Instruction* as basic instructional methods which remain true no matter what program or practice to which they are applied (p. 43). Many instructional practices or variable methods (Reigeluth, 1999) each incorporate only a few of these basic principles, and therefore none of them adequately provides an exhaustive implementation of the fundamentals for effective instruction (Merrill, 2002b). With so many learning theories and models presented for consideration, the attempt through the creation of the *First Principles* was to illustrate the fundamental requirements of learning seen across all models (Merrill, Barclay, & van Schaak, 2008, p. 174). They are meant as guiding structures that can be applied regardless of the instructional program or the practices employed within the program (Merrill, 2002a, p. 44). If this is true, then they should have applicability to any educational program with an instructional focus (i.e. educational technology programs). The *First Principles* have been used successfully in the corporate training arena (Collis & Margaryan, 2005; Merrill et al., 2008) and have a strong correlation to positive results when considering the needs of adult learners. The task-centered approach to instruction is what makes this framework so flexible and open to modification according to the unique needs of a 1:1 program.

The *First Principles of Instruction* are composed of a central, problem-centered instructional principle and four additional principles representing the four phases of effective instruction (Merrill, 2002a, pp. 44-45). Merrill summarizes the principles the following way:

Learning is promoted when:

1. Learners are engaged in solving real-world problems (Problem-centered).
2. Existing knowledge is activated as a foundation for new knowledge (Activation).
3. New knowledge is demonstrated to the learner (Demonstration).
4. New knowledge is applied by the learner (Application).
5. New knowledge is integrated into the learner's world (Integration). (p.

44-45)

Without elaboration, one may already begin to see how these principles take shape within a device 1:1. The similarity to popular technology integration models such as the *SAMR* (Substitution Augmentation Modification Redefinition) model (Puentedura, 2013) is not coincidence as these principles, again, are seen as fundamental for learning design. But in the context for which I propose to contextualize the importance of instructional design thinking, there should be a restating of the principles for constructing a program that is not simply concerned with lessons and activities. Because we considering a system for successful technology implementation and integration, the principles must highlight those elements for a school's program. Our new 1:1 guiding principles are:

Instructional transformation is promoted when:

1. Program objectives align with solving real-world problems.
2. Faculty activate current practice as the foundation for new instructional activities.

3. Ongoing training demonstrates new instructional practices to teachers.
4. New instructional practices are applied in order to achieve short-term program objectives.
5. Achievement of short-term program objectives causes diffusion of new instructional practices which begins to redefine the educational system.

While these principles are untested and theoretical in their applicability to 1:1 programs design, the need for guiding principles nonetheless is present. Every program and ‘how-to-guide’ outlines a different course followed to achieve implementation and integration, yet none can truly agree on the best form.

For example, while some large-scale rollouts chose a ‘top-down’ model for organization and training, beginning at the state- or district-level leadership then filtering down into the schools (Balanskat et al., 2013; Mao, 2011; Saltinski, 2014; Silvernail, 2005), others began within the buildings and built their capacity from within the buildings (Hanson, 2015; Shapley, Sheehan, Maloney, & Caranikas-Walker, 2009). Also, some insist upon periodic training throughout the school year (Branch, 2014; Jahnke et al., 2017), while others still only provide the type of ‘just-in-time’ support for their teachers as they see issues develop (Belcher, 2014). There may not be a ‘right’ way to implement a 1:1; however, a framework needs to be developed to inform new adopters and those who seek to improve their programs.

Systemic Change

Embedded within the proposed framework for 1:1 program design is the expectation that all of the work will lead to diffusion and a paradigm shift in the educational system. The effective planning and introduction of the device program

paired with the continual development of pervasive instructional practices by teachers leads to diffusion because it offers a relative advantage over the system currently in place (Rogers, 2003). When the perception of success is present, the idea for innovation begins to permeate through the very fabric of the system, and it begins to change.

Any institution that is pursuing a 1:1 device program has the intent to change their learning environment. The technology provides an opportunity to change and, if effectively managed, eventually becomes an integral part of a system. Diffusion can happen even if no measurable changes are evident. Rogers (2003) outlines the five qualities an innovation must possess in order to influence the rate of adoption: the perception of relative advantage, compatibility, complexity, trialability and observability. Diffusion begins to take place when incremental successes are experienced in classrooms and they are perceived to be a positive progression toward higher achievement. It does not matter if evidence is present to suggest positive results are happening. What matters was that the students, teachers and parents perceive the learning approach taken by a few teachers to be more effective when using technology or presenting learning opportunities where students have a choice in the activities.

When considering the best approach to instituting change in an educational environment, it is important to recognize the intent of the proposed change system. Is the change suggested addressing isolated events or occurrences in the overall system? Or, rather, is the change intended to affect the larger school as an operating unit?

While piecemeal change focuses on but a small piece of the school system, such as individual classrooms, systemic change addresses all aspects of the educational system (Reigeluth & Garfinkle, 1994). The systemic approach addresses the larger pedagogy of education in an attempt to affect long-lasting change for the system (Joseph & Reigeluth, 2010), and, thus has a greater possibility of diffusion because the likelihood of success grows as the whole environment experiences a paradigm shift (Joseph & Reigeluth, 2005; Rogers, 2003). Leaders must ensure the development of a change mindset, redefining education, and designing a systems to evaluate the effectiveness of the change proposed (Reigeluth, 2006).

True systemic change is difficult because of its multi-faceted and time-consuming nature. Also, a true paradigm shift requires educational policy and societal changes which is difficult to do from the school or district level (Joseph & Reigeluth, 2010; Reigeluth & Garfinkle, 1994). Cuban (2006) agrees that in regard to technology, lasting change is all but impossible until high-stakes assessments (ACT, SAT, etc.) mirror the type of learning that is possible through the use of classroom technology. Though this is true, the information age has brought opportunity for bottom-up development and systemic change movements that affect the overall environment (i.e. college/career readiness movements, charter school movements). Most of these movements were started at local or state education levels and have diffused out into the wider system.

Again, while this capstone is not a means to provide the type of guidance that typically accompanies research-based works on the topic of 1:1 implementation, it

does provide a first -hand account of the manifestation of the topics outlined above. It is hoped that from these accounts, and further research into the applicability of the recommendations that a true framework can be developed to assist in educational change efforts.

Why am I the person to write this capstone?

I'm not an accomplished researcher; I'm a teacher. I'm a teacher that piloted mobile devices in his classroom in 2008, instituted the acquisition of the first tablets in his district in 2009, and began managing a whole-school 1:1 program in 2012. Through it all, I have never stopped teaching.

Currently, much of the research and exploratory writing on 1:1 device programs comes from external researchers (Hanson, 2015; Silvernail & Bluffington, 2009; Valiente, 2010), school leaders (Belcher, 2014; Branch, 2014), or from policy-development entities (Brzycki & Dudt, 2005; Kasraie & Kasraie, 2010). Additionally, many only give a snapshot of the impact of the programs outlined, rather than a longitudinal investigation that spans years.

My accounts are written as someone who has lead, managed and instructed within the environment over six years. No other piece of research, or narrative has the ability to have this kind of perspective that I offer in my work. From direct conversations with leaders and teachers, to student interactions, I have the unique opportunity to offer a different point of view on this topic; and add my experiences to the conversations surrounding the effectiveness of educational technology programs in K-12 schools.

So, why me? I work with teachers, students and their devices every single day. This enables me to see these types of programs in a unique way and try to pass that perspective on to others interested in this topic.

Reflections

Initially, my Capstone was a collective review of the literature which would assist in the development of 1:1 programs that mean something, and that have the possibility to truly change the system of education as we know it. My personal accounts from working and teaching within a 1:1 served merely as transitions into the topics covered. The resulting text did not accurately represent me as a professional or the work with which I have been involved.

What then developed was the current Capstone work and its format. My stories became the focus of the writing, while existing research supported my reflections on them. What I feel resulted is an accurate depiction of who I am as an educator, and who I have developed into because of the Morehead State University program. This capstone project represents not just the culmination of my work to complete my degree; it represents the culmination of all the work I have been doing in my school for the better part of a decade.

Creating this work and participating in Morehead State University's practitioner-oriented doctoral program has allowed me to look back on my experiences and find my part in both the mistakes and the successes. I firmly believe that other practitioners will be able to identify with these stories and say, "I have had

the same thing happen to me.” From there the conversation on improvement can truly begin.

1:1 programs pervade the landscape of education today. It is probably the most high-profile change effort to happen in the last 15 years. If educators at all levels of an organization are not coming together and sharing their experiences, improvement cannot take place. No innovation has ever occurred in isolation. My intention is to take my experience outside of my silo and share it with the world.

Why is this a leadership issue?

Leadership is the most critical factor in technology integration efforts (Byrom and Bingham, 2001). Transformation efforts fail when there is a lack of resources, training or support. Leaders have the responsibility to provide all of these for their constituents but can sometimes fall short. This is not necessarily due to a lack of ability or work ethic; many times, it is because many leaders are ill-equipped to lead in a 1:1 environment.

That is why I feel this work is so important. Leaders need to be informed of the current landscape of educational technology research and best practices in order to keep up with the changes currently taking place. The information can then be used by leaders to chart a new direction for their organizations and to develop them into future-ready educational institutions.

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Appendix A
Capstone Project

**One-to-One
or
One-to-None?**

**A Look Inside from a
Certain Point of View**

Sean R. Jackson

TABLE OF CONTENTS

	Page
Preface.....	46
Introduction: Devices Will Not Work Miracles.....	50
Don't Try to Have All the Answers	56
Believe in Your Great Teachers.....	65
Train Your Faculty.....	74
Devices Amplify Current Practice	84
Persist.....	93
Conclusion	99

Preface

I was in the middle of teaching an afternoon U.S. History class in the fall of 2008 when the phone rang.

"Mr. Jackson, this is Dr. B. I heard that you got an iPod Touch and I was wondering what you thought of it." This phone call was the first conversation with Dr. B that I ever remember having in my three years at Mason County High School. My wife had given me an iPod Touch for Christmas of 2007, and I thought it was one of the most exciting gadgets I had ever seen.

"Well, I like it so far. I haven't gotten used to it, but I'm learning."

"In your opinion, could there be ANY possible benefit to having them available for use in the classroom?" I hadn't considered whether the device had the potential to be a learning tool, and the concept piqued my interest.

"Umm...I really don't know right now, but I guess there are some possibilities."

"I was thinking about piloting a test set in a classroom, and someone suggested you as a candidate. When is your planning? I'll come by this week, and we can talk about it."

Later that Night

"So, I got a call this afternoon from Dr. B."

My wife's brow wrinkled, "Really? What did he want?"

"He asked me if I liked my iPod Touch and if I would be interested in piloting a classroom set of them at school."

"Why?"

"He wants to see if they would be good to have in a classroom I guess. I have a meeting with him this week on my planning."

"What are you supposed to DO with them in class?!"

"I have absolutely no idea." This opportunity from Dr. B represented my first experience with devices for learning and shaped the course of my career interests and pursuits.

As a relatively inexperienced teacher in 2008, I attempted to focus on the History content and the routine of what I thought constituted "learning;" the same process to which I was accustomed in my time as a student. Essentially, the 'factory' model which has shaped our image and standard for traditional education was so ingrained; I was thinking in those terms when asking how to handle the devices. Was there content that could be easily transmitted through the platform? Was there a textbook that was all digital with all the materials a teacher would need to be incorporated into the lesson formats? How do students turn in their work? Does every content area have different uses for the devices? At the time, I found few resources that applied to those areas, and much of it was difficult to set up, required a high level of technical expertise to manage or was impractical when it came to implementing it in a class with a wide-range of student ability levels. So, I had the devices in my

classroom, a brand-new MacBook and I had no idea what to do. Thus, began the most frustrating six months of my career.

Most of my spare time became consumed with learning about the operating system, technology systems for learning and how to make them useful in my lesson objectives. I would plan whole lessons out, and one thing would not work, so the entire experience was ruined. The students were getting repeatedly frustrated and just wanted to "go back to listening to you tell us about History, Mr. Jackson." I couldn't do it; I couldn't just give up on this. There was merit in having devices in the classroom, but I was limited by the inadequate resources and tools at my disposal at the time. I persisted, and a few months into the pilot, I wrote down a list of things that would make the devices perfect for any classroom:

Apps/Systems for Mobile Learning "Wish-list"

1. *An online assessment tool that auto-grades*
2. *Easy system for distributing assignments*
3. *Video Editor*
4. *Access to technology-ready texts and lessons*

Looking at the list now, I think I did an excellent job of capturing what the field of device-oriented educational technology would look like over the next decade. And mind you, I was only a classroom History teacher with no formal Ed-Tech training or foundation of research. I went with what I thought would work for me or others journeying down a similar path.

In the past decade, our school began a 1:1 iPad program for five years and recently transitioned to Chromebooks. As a rural high school in Kentucky, it was a bold move on the part of the district and building leadership; yet they fully embraced

the idea. With just over 800 students and 42 teachers, our high school became the first in our region to have a 1:1 device rollout. While there was apprehension and skepticism, our community supported the effort as well, citing that the need to integrate technology was something that could help prepare students for their careers or in a post-secondary setting. The devices have changed, but the intent has always been the same; to transform instruction to meet the needs of the 21st Century learner.

I left the History classroom because I found my passion in technology education. I teach Computer Science and continue to manage our High School 1:1 device program, as well as the 1:1 program that diffused into the middle-grades in 2016. I have lots of experience dealing with the problems that manifest in a device-rich environment and desire to dedicate this volume to conversing on what I see as imperatives for educators looking down this path. I'm not an accomplished researcher. I'm just a teacher who has been at the head of a school 1:1 program for the last six years. I relate my experiences to the best of my memory and provide the lessons I learned in the hopes that others will use them to inform their planning or improve their current system.

Sincerely,

Sean R. Jackson

Introduction

Devices Will Not Work Miracles

If one takes a moment to look through their Facebook timeline, I wonder how many ‘miracle’ products will be seen promoted? Through social media, spam email and falsified news articles, these charlatans are attempting to convince the unwitting public to buy what they are selling. The same is essentially being done to educators. Brief glimpses of an educational product or system’s effectiveness is given which touts far-reaching effectiveness to completely revolutionize classroom practices. The products are seen as panaceas for what ails students today, all with the sole attempt to make money, not to educate students.

Probably the most identifiable examples of this are products and services related to educational technology. Whether it be a device, a curriculum program, or a learning management system, claims are made that they will produce real results in the classroom; and increase student achievement. Nothing could be further from the truth.

In my experience working in a high school 1:1, nothing has been more valuable than the lessons I have learned from specific interactions with leaders, teachers and students. My experience has taught me six main lessons:

- Lesson 1. Devices will not work miracles
- Lesson 2. Don’t try to have all the answers
- Lesson 3. Believe in your great teachers
- Lesson 4. Train your faculty
- Lesson 5. Devices amplify current practice
- Lesson 6. Persist

The most important of which is Lesson 1, which I learned when dealing with parents in the first year of my school's 1:1 implementation.

"I'm sorry, but I am not really sure why you are calling me about this," I said, again, to the distraught mother on the phone.

"Because aren't you the iPad guy?! My daughter is failing her classes because of these things, and I want her not to have to use it. She was a good student before these stupid things."

It never ceases to amaze me how quickly people identify their problems with a device or innovation. "Well, I'm sorry to hear that," I replied, probably a bit too condescendingly. "Let me check on a few things." I began looking up the identified student in our information system and looked at her records. "Interesting. Your daughter failed all of her classes last year before we even had the iPads. What was the issue at that time?"

I won't lie, this wasn't my first call like this, and each time the situation played out the same way. The device is accused of causing the issues; the parent requests that the child does not have one at all, and I provide evidence that the student was performing at precisely the same level as before device implementation.

There was a long pause on the other end of the phone. "What?" asked the distraught mother.

"She failed her classes last year, and you are upset with the device causing her issues this year. I simply asked what the issue was last year that caused her to fail. It wasn't the iPad. So, what was it?"

"You are just rude. I am trying to help my daughter!"

"So am I. All I want to do is help our students. Taking responsibility for one's actions is the best lesson we can ever teach them. The device is not the issue. Your daughter needs to take responsibility for her grades and not blame the device for her issues that she has had for several years."

The call ended there.

This mother was attempting to blame the device for the daughter's failing grades. But I have never seen an instance of the device changing a student that drastically. There really is no significant difference in the performance of students when instructional technology is incorporated into the daily routine. At least I have never seen it happen.

Who am I to tell you about device 1:1 environments? What are my qualifications? In the past six years, I've been called, "The iPad Guy, The Tech Guy, The Computer Science Teacher, The Internet Nazi," and the best one yet, "Mr. Jackson a.k.a., the Devil." I have spent the most recent years of my career working on the implementation and integration of one-to-one technologies (first tablets and most recently laptops) in a rural, public high school environment. Additionally, I have been in charge of managing and maintaining the devices and monitoring systems,

which is why I am unpopular at times. The devices have changed (and will continue to change) but the imperatives for achieving effective instructional transformation have remained, no matter what technology was implemented. I am not an expert, but I do believe in the power of experiential learning. Experience is an excellent teacher if you take the time to learn a lesson from both success and failure. All the time I have working within a one-to-one environment, nothing has been more valuable than the mistakes made along the way. These have provided the basis for the exploration of creating an effective and sustainable program. I own the problems in the program with which I have worked; they are as much mine as they are anyone else's. When mistakes are highlighted within the Mason County program or even others, they are not meant to be harsh criticisms or points of "they should have known better." Rather, I intend to provide mistakes as learning experiences from which all can gain powerful information.

If you have already put the devices into your environment, you may have discovered that they do not serve as an answer to problems. They are tools to be used for enhancing your activities, creating the opportunity for new instructional practices and for enabling students to become active learning participants. I have found that they do provide a basis for teachers to experiment with new strategies and activities that can help develop 21st Century skills; that is if those teachers are willing to attempt to change their practices. By treating the teachers, not the devices, as the keys to instructional transformation, a 1:1 program has the power to maintain high expectations for the students and become a sustainable system.

So, what is your choice? A 'one-to-one' where every aspect of your institution is positively affected by the devices in hand? Or, a 'one-to-none' mentality of the devices being the goal, rather than the means to something bigger? If you want to accomplish more with your device program, the lessons contained here should prove useful to your efforts. The most important of which, again, is to remember the devices will not work miracles.

1:1 Lesson 1—Devices will not work miracles.

Believing that a device will change student achievement is a grave mistake. If you attempt to communicate anything but that message to teachers and parents, your implementation efforts will fail.

Suggested Further Reading

Russell, T. L. (1999). *The no significant difference phenomenon: A comparative research annotated bibliography on technology for distance education: As reported in 355 research reports, summaries and papers*: North Carolina State University.

In probably the most notable collections of research on the subject, Thomas Russell presents validation of the 'no significant difference phenomenon.' Surveying over 300 pieces of research on educational technology, Russell repeatedly finds that the media used for instruction has no real effect on the learning outcomes of students. Most recently, Russell's work has been

associated with the 1:1 movement in K-12 education in an attempt to bring exaggerated claims into context.

Don't Try to Have All the Answers

Along with having the belief that a device can solve problems with student accountability, many leaders in 1:1 schools make the mistake of trying to have answers to all possible questions before setting out. The second lesson is: Don't try to have all the answers.

Now, that is not to say there should not be considerable planning and organization before implementation. Effective planning is a cornerstone of sustainable 1:1 programs. However, leaders should focus on a transformational approach to organizational change. This approach is a continual process of vision communication, capacity building and empowerment; it allows the organization to grow and develop the ability to address problems as they arise. By far, this is the best way leaders can facilitate lasting change to their environment.

In the spring semester of 2012, we began to see that we finally had momentum for a program we had sought to implement for almost four years. Dr. B, our Assistant Superintendent and District Technology Coordinator began communicating with those who were interested in the program through email.

I'm planning a proposal to the board on March 19th. We may want SA or RB to speak briefly, or even a couple students testify. If this is approved we need to get an "implementation team" from MCHS assembled immediately after that. This committee can help decide on management procedures, PD, policies, rollout, discipline, student fees, etc. We will also want to get an iPad in the hand of every teacher ASAP and training this semester.

Thanks,
Dr. B

Because I was the first to pilot mobile devices in my classroom and had worked on writing grants to acquire our first labs of iPads in the district previously, I tried to use my knowledge to contextualize the learning aspects for device implementation. I followed his email with information on required standards and information on 21st Century Learning Outcomes. Mind you, I was still trying to figure out how I fit in with the whole plan, but I decided to offer any information I could to help convince our board to fund the program. He responded:

Sean,

That is useful information on the technology standards. Thanks for your effort! In addition to the "flipped classroom" model, I am also researching *Challenge Based Learning*. These types of multidisciplinary approaches to instruction go hand in hand with the high school's focus on revising classroom structure. That will be the key selling point to our central office and board of education for the iPad 1-1. The device for the sake of just having a device will not fly in their eyes. The KY tech standards listed helps our case. My focus on selling this project to the board on the 19th will be using the iPad as a resource for students and teachers to support the change in instruction that is already expected.

Thanks,
Dr. B

"My focus to selling this project...will be using the iPad as a resource for students and teachers to support the change in instruction that is already expected."

This one statement adequately sums up what convinced me to join in the pursuit of the device 1-to-1 in Mason County, and why I continue to dedicate the majority of my time to its management and maintenance. The vision was not to provide a panacea for

all of the problems facing education, but rather begin to move toward change that could provide the context for improvements. I am still impressed with the approach taken by Dr. B and other members of our planning team. The vision had been shared and fostered for years of pilot phases to convince more and more individuals to buy into the idea (and feasibility) of providing all students with a device for learning. Not just that, teachers seemed excited at the prospect of every student having access to the internet, research tools, and productivity applications. We convinced the supporters of the 'why' behind the idea; then we moved onto the 'how.' That's where the troubles began.

In 2012, whole-school device, or one-to-one programs, were only beginning to become popular in public K-12 institutions. At Mason County, we had been building our wireless infrastructure in preparation for such a program since 2008. The planning team and district leaders visited every other institution within 1000 miles who had such a system, and one thing was evident; not one of them had discovered the secret to success. If I may be quite honest, many of them were simply 'putting on a great front' that would gain attention but weren't changing anything about what they had always done. On one school visit, a teacher had the entire class tape a piece of paper over an iPad screen, and the students took lecture notes on the paper. Anyone passing by the room would see students furiously 'using' the device, hopefully avoiding any criticism from administrators.

Now, the 'paper over the iPad' is an extreme case but points to the much larger issue that develops in educational technology initiatives. While teachers at

Mason County expressed excitement at the idea to members of the program development committee, the most real emotion present was fear. Questions such as, "I can't wait...but how are you planning to handle [*insert random, unforeseen consequence of technology in the hands of teenagers*]?", or "Is there an app that can [*insert random, specific content-focused element of a given topic that may only be used once throughout a school year*]?", dominated every conversation and interaction I had in the six months following the approval of the device purchase proposal. While technology was not new to the school, its pervasive presence in day-to-day teaching practices intimidated many and brought some to tears—more on that later.

What were they so afraid of? The unknown. I challenge you to poll any school faculty in the United States on their planning practices and see if there is any indication of the majority just 'going with the flow.' I'll wager that you will determine that most teachers are well-practiced planners and organizers who pride themselves on maintaining order within their rooms. When you introduce an unmitigated machine of chaos (a.k.a. internet-connected device) into the everyday classroom, those teachers will feel as if they have lost a significant portion of their control. Teachers will then begin looking to you, leaders, for the answers on how to manage their new digitally-enhanced classroom. You will not have the answers, and that has to be okay.

Northouse (2015) indicates that the best way to implement an educational technology initiative is through the transformational leadership model because of its ability to change individuals while changing an institution. However, there are no

requirements placed on transformational leaders to be tech-savvy, educational technology experts, or to have answers to all of the 'tough' questions right away. As a transformational leader, there are only three imperatives to instituting a change of a technological nature:

- Imperative 1. Communicating the vision
- Imperative 2. Providing guidance and training to build capacity and achieve goals
- Imperative 3. Empowering others through distributive leadership

Looking at the verbs in the imperatives—'communicating,' 'providing,' and 'empowering,'— indicates that this is a process-based leadership approach. It is developmental both for the leader and constituents and should continue to change as the needs and competencies of the institution develop. Fullan and Stiegelbauer (1991) make the distinction between *innovation* and *innovativeness*. Innovation relates to the content of the program (seen here as Imperative 1), while innovativeness connects directly to the capacity-building within the organization to continuously change and sustainably adapt to change (Imperatives 2 and 3). The transformational leader within the school, then, must only be aware of the possibilities technology provides and how they can be integrated into teaching and learning while preparing those teachers to solve problems in the future

As a leader who is attempting to act with a transformational approach, the goal is not to have all of the answers before setting out; but to have created the capacity within your constituents to address the problems as they arise in the future. Perhaps for a more basic definition, we can view *innovation* as an event, while

innovativeness involves a process. If this is the case, it is the transformational approach that provides the best avenue to innovate.

Looking back, I believe we were as prepared as we could be when beginning our one-to-one program. However, I cannot think of one time where anyone on the planning or implementation team pretended to have all of the answers. At the time, that was problematic and created frustrated teachers; but that was expected. In one-to-one device programs that failed, like the one in the Los Angeles Unified School District (LAUSD), leaders pretended to have a plan or process for every contingency. When their plans failed, so did the entire program.

Instead of trying to plan for everything, I would suggest creating a team that can help solve the problems that may arise. In our first year, we had a handbook created that covered some of the major topics we may encounter. The policies outlined what happened if a device needed to be repaired or was stolen, but failed to outline policies regarding inappropriate use of social media etc. When confronted by parents or teachers on what to do, the administration was left to guess at what should happen. Many times, students lost all access to the devices, which caused problems with them completing certain tasks in their classes. Had we created a committee of stakeholders to address such issues, we could have created more constructive responses to such issues and still maintained the integrity of our device program.

So, leaders, have a vision toward which to aspire but develop the capacity in your constituents to solve problems as they arise; through the transformational leadership approach. Every case, every district, and every school is unique and must

apply transformational methods according to their own needs. Successes or failures are entirely dependent upon a leaders' ability to transform his or her environment using the resources at hand. It is okay to not have all the answers right away.

Sometimes, telling someone, "I don't know," has to be an acceptable place to begin a new conversation.

1:1 Lesson 2—Don't try to have all the answers

Be informed, conscientious, and reflective but don't pretend to know everything.

Following the imperatives of transformational leadership will equip your school to handle the troubles encountered and navigate the changes that come in the future.

Suggested Further Reading

Avolio, B. J., Waldman, D. A., & Yammarino, F. J. (1991). Leading in the 1990s:

The four I's of transformational leadership. *Journal of European Industrial Training, 15*(4).

The authors highlight critical differences between managers and leaders. The Fours I's – which are the marked imperatives associated with transformational leadership are described along with their impact on follower development, effort, and performance. What becomes evident through this particular research is that the transformational efforts must be maintained and diffused throughout the organizational environment. Transformation does not happen and then end; it continues to develop and change over time.

Fullan, M., & Stiegelbauer, S. M. (1991). *The New Meaning of Educational Change* (3rd ed.). New York: Teachers College Press.

The author examines the meaning of change in educational settings and the reality of actually accomplishing that change. Citing experiences in the field, Fullan highlights traditional barriers to educational reform and guidance through some of the more challenging aspects of programs designed to change long-held beliefs and practices. Ultimately, it is determined that individuals actively choose to make their program a success or a failure.

Kotter, J. P. (1995). Leading change: Why transformation efforts fail. *Harvard Business Review*, 73(2), 59-67.

In this article, the author does present eight steps that will assist to transform an organization. However, the majority of the material shows counter-examples to this model. Examples of transformation failure are presented to provide context for the reader to evaluate his perspective on the issue of transformation. While applicable to a variety of organization types, educational change agents are well served to avoid the pitfalls discussed.

Northouse, P. G. (2015). *Leadership: Theory and Practice* (7th ed.): SAGE Publications.

While not solely focused on education, the author provides practical application of leadership theory through case study investigation. Each

method outlined is accompanied by case studies which serve as illustrations of the pertinent points for leaders to consider when applying the principles discussed. The standard format of this volume allows both researchers and practitioners the ability to compare theories and extract the lessons from the studies.

Saltinski, R. (2014). *Ethics and technology: The good, the bad, and the ugly in the Los Angeles USD iPad Project*. Paper presented at the National Technology and Social Science Conference.

In 2014 the LAUSD iPad program collapsed because of many problems including ethics violations. Broken agreements, kickbacks, and misinformation sabotaged the entire plan well before the devices were ever distributed to students. The author investigates the societal and ethical implications of the program and evaluates the lessons to be learned from this epic failure.

Believe in Your Great Teachers

We recognize that the ability to address needs and issues as they arise is part of the transformation process; and that the devices alone will not yield significant changes in how students perform. What, if anything, begins to really start changing our educational environment? What resource has been repeatedly proven to make all the difference in how students perform? Of course, teachers are the answer. Which brings us to our third lesson: Believe in your great teachers.

Now, not all teachers will be enthusiastic at the changes proposed in a 1:1 integration project. Some simply do not have the desire to try anything new and will resist the attempt to incorporate the technology or tools into their classrooms. But the ones that have a desire to improve, and an inborn motivation to act on behalf of their students, will use every tool at their disposal to do so.

Mrs. H was a veteran teacher, who didn't care to hide that she had only a few years left before she was, in her own words, "outta here." However, at the first professional development session of the 2012-2013 school year, she seemed as excited as any of the faculty when she received her iPad.

Mrs. G, another veteran teacher, was more reserved about her apprehension. She did not openly share her concern in the group, but many could tell she was upset at the thought of such drastic changes. She was close to tears several times in early training when she couldn't figure something out.

Even teachers not in the sunset of their careers set out and changed little to nothing about their classroom procedures or practices for a variety of reasons. Ertmer (1999) classifies external barriers dealing with adjusting to the use of computers in the classroom as 'first-order barriers to change' (p. 47). These barriers manifest when basic operating routines do not change because existing structures or abilities block the change from happening. These barriers have little to do with personal ideas, emotions or attitudes toward change, and can be remedied by strategic planning. The most noticeable first-order barriers in educational technology change efforts are access and skills. In contrast, the beliefs and opinions that block change initiatives are classified as 'second-order barriers to change' and are difficult to overcome.

Teachers were not expected to come in day one and begin teaching in a completely transformed classroom; quite the contrary. We set out with the idea that we would not force anyone to incorporate these new tools. It was believed that the changes would take place as teachers were comfortable making them, or when they were the only ones 'not using them.' Think this is a bit idealistic? I believe it is. It assumes that the only barriers keeping us from change are those of the first-order and that the teachers are all intrinsically motivated to incorporate new practices into their existing classrooms.

Breaking down the access barrier (first-order barrier) means having the tools available to make the changes envisioned. We solved the access barrier by providing every student and teacher with the same, high-quality device to use for learning. Our bandwidth was adequate to support the influx of devices, and systems were in place

to make sure that our high-poverty population had the opportunity to benefit equally. As opposed to 'bring your own device' (BYOD) initiatives that depend on students and parents to provide any device they can, our program did not discriminate by socio-economic status.

Both Mrs. H and Mrs. G had the tools required to begin changing their classroom practices, but they both appeared to struggle with acquiring the skills with which to do so. To address this barrier, a specialized training team was hired and provided support on this subject. The group consisted of a professor of instructional design and accomplished classroom teachers. We began, as one usually does, at the beginning; with the necessary settings and functionality of the iPads. This essential coverage of features was followed immediately by a full-dive into apps and systems that could be used to adjust current practice and embed the new digital tools in instruction.

"I've been doing this too long," loudly declared Mrs. H during the first iPad training days, "I don't think I'm going to be able to do the things you're asking."

"I am just not good enough with this technology stuff," confided Mrs. G. to another teacher.

Since Mrs. H was more open about her issues, the attention of the training team we brought in was drawn to assisting her. "What is the one thing that seems most difficult to you about integrating technology?" asked the professor, Dr. C. It was then that he spent the next day and a half specifically working one on one with Mrs. H to assist her in developing a plan of action for technology integration in her

classroom. Until her retirement a few years ago one could tell little difference in the activities implemented in Mrs. H's classroom. "I spent most of my time focusing on helping her," Dr. C reflected later, "but she chose not to try."

With a teacher like Mrs. H, it doesn't matter how many resources are at their disposal or how much training is provided to build technology skills; the desire to change is not there. There are very few things outside of mandating and monitoring that a leader can do to change that fact, I have seen tying technology implementation to yearly evaluations in other schools, but with varying degrees of success. Many educators view technology programs as just another 'trend' that will pass just the same as many others have in education. Leaders must persist in the tough times and see through the challenges to sustain programs to avoid them being seen simply as a 'passing fad.' There is no skill that can be developed to make someone want to do something, or tool that can be issued to remedy a bad attitude.

Many of our teachers, though, had the desire to integrate technology and understood the 'why' of the program but struggled with the 'how' for years after device roll-out. Had we, as the program's leaders, focused on more of the technical nature of device use and been consistent about incorporating training throughout the school year, we may have been able to avoid early issues dealing with user agency and acceptance of the program. If one does not know how to maneuver through the mire of features present on internet-connected devices, it is difficult to emerge on the solid ground of instructional integration.

Mrs. G was one of those teachers. She didn't know how to do some of the things she wanted to do, but she was willing to try. I didn't hear about her issues until after the training completed, and I attempted to keep an eye on her. One day she came to see me. "I need some help. I need to use Skype with one of my students."

I was a bit shocked, so she explained that an AP calculus student had undergone surgery and would be out until after Christmas. She wanted to enable the student to Skype in during that class daily and view her lessons as well as the class discussions.

"I think that's a great idea. Let's see what we can get set up." She was able to connect with her student throughout his extended absence, and that student lost almost no instructional time because of Mrs. G.

Today, technology integration is an expectation rather than an innovation. What seemed innovative in practice just six years ago when beginning our journey with technology integration, is now commonplace in many public schools around the nation. There is still a significant gap between the expectation and the preparation for teaching in this type of environment. Teachers entering the field have neither the training on nor the technical skill required to manage and instruct within technology-integrated classrooms. The expectation to use and proficiently adapt tools with which they have no training is a fundamental flaw in this demand for more technology competency.

With in-service teachers at different points their career, we do not have the luxury of modifying preservice training programs. We depend heavily on 'just-in-

time' information that can reach an audience of broad ability levels and needs. As important is the ability to access support when needed. Mason County created a technology helpdesk and found an educator familiar with the devices—me—to head up that service and support center. Access to support was what enabled; the teachers only had to seek it.

Mrs. G was uncomfortable and very nervous about beginning her technology integration journey. However, when it came time to help a student make the most of a difficult situation, she stepped out of her comfort zone and sought help. She embraced the challenge because it would benefit her student. Mrs. G is retired now, but still teaching at a private school. She commented to me that the thing she missed the most was, “The technology we had available.”

"Technology integration is an s-l-o-w process" (Byrom & Bingham, 2001, p. 9). I will admit that I am an impatient person. I had to learn that the process of instructional change is one that takes lots of time and effort. When we began our 1:1, I was gung-ho about creating instructional shifts and disrupting the usual classroom routine. I was using part of my time to manage the technical aspects of the program, and I saw that not every teacher was as enthusiastic about the changes as me. I thought that things should be moving or changing faster than they were. I should have taken the time to appreciate the efforts of great teachers and learn to celebrate even the smallest steps toward integration. I got caught up in the negatives, and that began

to alienate some of my colleagues. Quite possibly, my impatience may have set us back in our efforts. I can't really say for sure.

In hindsight, the first few months of the program were progressing much the same as other 1:1 programs have. Our best teachers were testing the digital tools slowly and attempted to incorporate a little at a time to ease into the adjustments. So, I encourage you to never underestimate a teacher who is provenly a dominant force in the classroom. Those educators who show, time and again, that they are effective instructors are the best resources for leaders implementing a 1:1. A great teacher is going to find a way to be effective no matter what resource is at their disposal, and no matter what their skill level is when using a new tool. Your most effective faculty will always find a way to what they do best; enable their students to succeed.

1:1 Lesson 3— Believe in your great teachers

Do all you can to address the barriers of the first-order. The confidence you have in your faculty is not misplaced. Take the time to listen to their concerns, address their needs, and give them the best opportunity to succeed. For those who are blocked by second-order barriers, persistence and sustaining the program are key to bring about change in those individuals.

Suggested Further Reading

Byrom, E., & Bingham, M. (2001). Factors Influencing the Effective Use of Technology for Teaching and Learning: Lessons Learned from the SEIR-TEC Intensive Site Schools. 2nd Edition.

The authors use personal stories from their experience providing intensive site support for schools in the southeastern United States and their technology integration pursuits. One of the most compelling stories describes the relationship between leadership and effective technology implementation. To the authors, "leadership is the most critical factor in technology integration efforts." This booklet provides insight into the factors that affect technology integration efforts. These lessons are very approachable and provide insight not only into leadership practices but also for those interested in teacher training and development habits.

Ertmer, P. A. (1999). Addressing first- and second-order barriers to change:

Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47-61. doi:10.1007/bf02299597

The author describes barriers to technology integration in schools as being either first- or second-order. First-order barriers to technology integration are external factors and include lack of access to computers and software, insufficient time, and inadequate technical or leadership support. In contrast, second-order barriers are internal factors and are linked to long-held beliefs, practices or motivation to change pedagogy. While both factors into the success or failure of educational technology or change initiatives, those barriers of the first-order are easily overcome through planning and adequate resource allocation.

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational technology research and development*, 53(4), 25-39.

The author evaluates existing research on teacher beliefs and their relationship to pedagogy and practice. Within the evaluation, it is proposed that the link between teacher beliefs and their actual practices are closely linked. Teacher beliefs must be addressed and modified before they can move onto pedagogical shifts. While this attitudinal shift is needed to change instruction, it is not required before introducing the new technology. It is a process by which one can ease into change as they begin to change beliefs.

Train Your Faculty

Anyone who has worked in education knows that time is at a premium. This is especially true of through-year professional development activities. Balancing the mandates from state and federal agencies as well as the diverse needs of your faculty is tricky. Everyone is constantly seeking to have their brief spot in the lineup to cover their material. Real training, however, is more than just covering a topic. It takes time to facilitate and direct teachers through an organized plan in order to meet an objective. It is exactly like teaching a class. You should have a plan laid out and adequate time with which to lead the group through the activities designed to meet the objectives set forth.

It is a tough lesson to learn; but one that must be learned before a program suffers to fall into obsolescence. Lesson four directs us to train the faculty; and that should remain a priority.

Training faculty is difficult when you may only have time set aside three to four times annually. That's how it has always been when going to Mr. F, our assistant principal, asking for time during those days to cover topics related to the device program and changes in the operating systems (OS).

“We have state testing ethics training that day and some items related to benchmark testing to go over,” Mr. F told me on one occasion. “How much time do you need?”

"Ideally, we should have about half the day so I can go over some of the changes to the OS, and I would like to help everyone begin transitioning to a new learning management system (LMS) in the next year," I replied.

"You can't have half the day," he responded, "we have too many other important things to cover. I can give you about 30 minutes at the end or the 30 minutes before we break for lunch."

I had been told before that I was, "responsible for the program and its support aspects," but that I, "did not have the ability to make decisions about the program without going through the principals." So, I took what I could get.

I boiled down the information to what I thought was absolutely necessary and made my plan for presenting the information. On the assigned day, I waited for my 30 minutes before lunch and began going through my material.

I began leading people through the material quickly.

"You're going to have to slow down," called out one of the teachers, as they hen-pecked the iPad screen, "some of us don't type that fast."

I attempted to slow but could already feel the time ticking away from me. I knew at this pace I would have to cut out most of the LMS discussion. I noticed that more of the tech-savvy teachers had already finished with what I was leading them through and were completely disengaged. I was losing them.

"You're still moving too fast! Sean, we need to be able to complete the tasks!" yelled the Social Studies Department Chair from the back of the room. I didn't have

even to look to see who said it; I was familiar with her tone as I had encountered it numerous times in the past.

"Listen, I have been given 30 minutes. Let's get through this one part, and I'll send you to lunch early." So, I limped through my tasks for ten more minutes and let everyone leave ten minutes early for lunch. Those were quite possibly the worst 20 minutes I have ever had teaching.

Later that evening, I talked to the Social Studies Department Chair, who also happens to be my wife, about the incident.

"You do realize that I had to take a half day of content and boil it down to 30 minutes? I could have used your support. I have frustrated teachers, and the last thing I need is more of them."

"We ARE frustrated," she countered, "and you need to take into account that some of us aren't as good with technology as you are!"

"That's why I need time to help all of you together!" I yelled.

That incident was in 2014, and since that time I have never again asked for time during a PD day to cover anything related to technology. What would be the point? I learned intimately, from this time and others, that the program was secondary to most of my building leaders, and that the training needs of the teachers were expected to be met differently. Specifically, I was supposed to show them how to do things only when they asked me for help. That may mean that I show the same thing to all 35 teachers in 35 separate instances. This made it very difficult to share

practices among peers or for me to help share my knowledge with others as a group and create a tech leadership team within the building as I had seen in other districts. I was seen as the "iPad Guy" for the school and was expected to refine my skills within a silo that was only opened when needed.

Now, I may be the "Chromebook Guy," but the scheme is very much the same. Dr. B has asked, time and again, for the High School to find someone that I can train to do all the things that I do.

"What happens if you get hit by a bus?" he poses. "We'll be lost." While that may be true, it has still not prompted anyone to set aside time for technology-specific training.

I was always told that a school's priorities could be seen in what they allocated both time and money on perfecting or building. We had a significant monetary investment in the devices, but we had a lack of time invested in building capacity for teachers to perfect their integration of the devices. That is why, even six years after implementation, I continue to see the same teachers using the same activities with the same results. We haven't seen a drastic change in what students are creating or doing, but we apparently do not know why things haven't changed. I've heard that doing the same thing over and over again, but expecting different results, is the definition of insanity. That sounds about right.

However, it has gotten better. Some teachers have sought out their professional development opportunities and have brought that knowledge back to transform their classrooms. Many leaders still do not have this program, which

touches every aspect of the school environment after six years, prioritized through the investment of time for training all teachers. Why? Should they not see that those seeking more training on their own are being successful? My answer would be that many of today's educational leaders are unequipped to foresee the training needs in new technology programs. We cannot merely implement and 'wait for the miracle to happen;' a program must be designed to maximize benefit and minimize the barriers to success. Every 1:1 should be designed through the embedding of instructional principles to affect instructional change. If instruction is at the core of educational change initiatives, the effect will be better-equipped teachers and, quite possibly, higher achieving students. The goals of school 1:1 programs should incorporate 21st Century learning skills for faculty and students, effective use of technology for learning, a move to decrease the digital divide among constituents and innovative approaches to pedagogy. Because of this, we should look at designing our device programs through the lens of instructional design. The instructional design framework found in Merrill's *First Principles of Instruction* (2002) provides flexibility and can be adapted for programmatic design purposes.

The *First Principles* have been used successfully in the corporate training arena and have a strong correlation to positive results when considering the needs of adult learners. The task-centered approach to instruction is what makes this framework so flexible and open to modification according to the unique needs of a 1:1 program.

The *First Principles of Instruction* are composed of a central, problem-centered instructional principle and four additional principles representing the four phases of effective instruction (Merrill, 2002, pp. 44-45). Merrill summarizes the principles the following way:

Learning is promoted when:

1. Learners are engaged in solving real-world problems (Problem-centered).
2. Existing knowledge is activated as a foundation for new knowledge (Activation).
3. New knowledge is demonstrated to the learner (Demonstration).
4. New knowledge is applied by the learner (Application).
5. New knowledge is integrated into the learner's world (Integration). (p. 44-45)

Because we are designing the system for successful technology implementation and integration, the principles must highlight those elements for a school's program. Our new 1:1 guiding principles are:

Instructional transformation is promoted when:

1. Program objectives align with solving real-world problems.
2. Faculty activates current practice as the foundation for new instructional activities.
3. Ongoing training demonstrates new instructional practices to teachers.
4. New instructional practices are applied to achieve short-term program objectives.
5. Achievement of short-term program objectives causes diffusion of new instructional practices which begins to redefine the educational system.

Rewording the principles is by no means an attempt to improve upon or change the real intent of the *First Principles of Instruction* in any way. I am merely taking Merrill's fundamental principles for practical instruction and reworking them to provide our prescription for creating a 1:1 learning environment which has

instruction infused throughout. While this outline is not tested, the intent is to provide a through-provoking look at the transformation effort.

At the core of these principles is training. Without adequate preparation, the process is incomplete. The transformation of your environment halts and the ability to affect lasting change in your system is thwarted. Had we, at Mason County, known more and could think in instructional terms about our whole system, we may have avoided much of the difficulties experienced. However, it is only upon reflecting upon our journey that the issues seem to become clear.

These guiding principles of instructional transformation, along with a transformational leadership approach, should drive a continuous process of training, support, evaluation, and revision of training program. As the devices, software resources and faculty continue to develop and change, so should the plan to support and reinforce instructional change efforts. Within your systems, make training your staff a priority. This way, you enable them to be ready for any tool that has implications for instructional practices. If you are going to continue investing money in devices, also invest time in training your faculty.

When educational transformation efforts fail, it is most typically associated with the lack of effective support systems for faculty. While there have been countless examples of individual success, I believe our 1:1 still struggles to enhance our best resources; the teachers. The teachers are the best allies a transformation-minded leader has. Leaders and integration specialists need to create opportunities

within their schedules to provide a planned program of ongoing instructional training and support. With this plan present, faculty are more likely to be exposed to ideas with which they identify. Then, they are more likely to begin attempting instructional transformation within their classrooms.

1:1 Lesson 4—Train your faculty

When considering what route to take to begin a 1:1, institutions must be willing to dedicate themselves to training their teachers. No matter what the device, or how big the institution, training is the key to sustainability and positive results.

Suggested Further Reading

Hanson, B. (2015). *The Impact of Professional Development on Early*

Implementation of a 1:1 Laptop Initiative. (Doctor Of Education),

Lindenwood University

This study examined the impact of preparatory professional development factors on the instructional occurring after implementation of a 1:1 laptop initiative in three high schools. The study found distinct correlations between the number of time teachers had access to their laptops before the 1:1 implementation and the change in frequency of use for instructional activities. Also correlated were the length of professional development preparation and the change in frequency of use of the 1:1 instructional strategies.

Holcomb, L. B. (2009). Results & lessons learned from 1:1 laptop initiatives: A collective review. *TechTrends: Linking Research & Practice to Improve Learning*, 53(6), 49-55. doi:10.1007/s11528-009-0343-1

This article focuses on the research findings focused on the effects of 1:1 laptop initiatives. Reviewing and collectively analyzing the available research, the author poses that while the intent of many programs focused on increasing student achievement, there is no significant difference in scores present in the research. However, indications of gains in student attendance and choice in an avenue for learning has been seen and may indicate that change is taking place that could affect achievement in the future. The main conclusion is that successful 1:1 programs go beyond the devices and focus on professional development that builds teacher competency to capitalize on the influx of technology.

Kotter, J. P. (1995). Leading change: Why transformation efforts fail. *Harvard Business Review*, 73(2), 59-67.

In this article, the author does present eight steps that will assist to transform an organization. However, the majority of the material gives counter-examples to this model. Examples of transformation failure are shown to provide context for the reader to evaluate his perspective on the issue of transformation. While applicable to a variety of organization types, educational change agents are well served to avoid the pitfalls discussed.

Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, 50(3), 43-59.

Through this investigation, the author intends to outline the fundamental principles that exist among the diverse instructional design theories. While not meant to be a theory, it does provide instructional designers a framework that can be followed to build an instructional program. The author concludes that although the terminology is different, the principles guiding all theories are universally accepted in practice, if not in name.

Devices Amplify Current Practice

Most of the experiences I share have little to do with devices themselves. The devices are at the very heart of what a 1:1 is all about, but they only have as much effect as the leaders, teachers and circumstances allow. All of the 1:1 lessons focus not on the devices themselves, but on the wider context of the environment in which they are being incorporated.

What, then, is the role of the device? Lesson five suggests that the device is an amplifier of current practice. This lesson was derived from a response a teacher gave during a focus group study, and it is the best explanation of what effect technology has on a classroom.

Along with the implementation training that happened in 2012, Dr. C and other members of the training team came back periodically over a four-year period to collect focus-group interview data from teachers and students. I was interviewed a few times but made sure to stay away from other interviews. I was reasonably sure that I would either get angry, disappointed or a combination of both of the things being revealed.

That didn't stop Dr. C from sharing the information, though.

“You don't understand! The kids will tell me ANYTHING about the program. Today they went over how people cheat using the devices.”

“So, what did they say?”

He showed me his written list:

Cheating With:

1. *Screenshots*
2. *Pictures of tests*
3. *Copying and pasting whole assignments from web pages*
4. *Swiping between apps to hide searching for answers on the internet*
5. *OpenDoor App?*

“Wow, they told you all this?” I asked.

“Oh, and there’s more...,” he continued revealing the information students provided that day.

Every year the focus interviews were conducted, the interviewing team heard the same information about the same teachers. Those teachers that never used the devices did not change. Also, the teachers that students bragged on or were thought to be doing well in their use of the technology was consistent during the reviewed period. If the students were reporting on the same issues in the same classes every year, why was there never a move to address the issues in the problem classrooms and openly tout the accomplishments of others? Honestly, I don’t know.

During one interview, a teacher shared their take on what a device—at the time it was an iPad in Mason County—did to the classroom.

You know, I shared with (the researcher) this thought: the iPad is an amplifier. Your strong students get stronger. Your weaker students get weaker. Unfortunately, they continue to struggle. The same is true for your teachers. I think there are strong teachers. They take it, and they can go with it, and it can be really good. I think that if a teacher isn't working hard and is not giving a good effort, I think the iPad is gonna make it tougher. So, you know, that's how I see that whole deal.

I have never heard it evaluated more accurately. If the students were solely dependent upon the devices to teach them, the gap between high- and low-achievers would be vast. However, put the devices in the hands of great teachers, and even your struggling learners can succeed. I have seen it happen.

Take Mrs. J, for example, who was one of the silent, but apprehensive, teachers during implementation. Mrs. J is an excellent, veteran math teacher. About three months into the implementation, she came into the Help Desk noticeably frustrated.

"We have a problem," she began, "I have no way of making sure that these students are focused during instruction. They are always looking at their iPads, and I don't know what they're on. Is there a way to lock them all out of inappropriate things during school times to make sure they are listening to teachers?"

I considered the question. "That sounds like a classroom management issue and not a technology issue. We should think of ways to help manage the classroom atmosphere now that we have devices, rather than try to accomplish a locked-down environment for everyone."

"Thanks for nothing," she snapped and walked out.

This interaction indicates the level of frustration teachers were experiencing in the early implementation period. The introductory training was designed not so much as a means to change pedagogy, but as a beginning to implementing the tool's use in the classroom as a replacement for current practices. However, the training did not address classroom management strategies or mindsets that had to be adjusted to

effectively use the tool. Since the pre-rollout training was the only training teachers had in five years of having the program, they came to me with their fears, frustrations, concerns, and their appeals. Imagine, on a daily basis, having 15-20 teachers contacting you with these concerns as well as 800 student devices to maintain and manage. There were many times where I couldn't adequately provide the support to teachers I probably should have. Mrs. J didn't come back specifically seeking my help for quite some time. However, when she did, it was different.

"I want to flip my classroom and I need to know how to make my videos," she declared.

I was a little speechless. I knew of the 'flipped classroom' model but hadn't heard of anyone in the building wanting to pursue one for their instructional method. "Really?" I questioned. "What made you decide to go that route?"

She revealed that over the summer, she traveled to a teacher development conference and attended a session on the topic. The principles behind the strategy appealed to her perceived needs in her specific classroom. "I have been doing this a long time and repeating the same math lesson over and over again each day is a little senseless considering the technology we have available. Plus, I want to make sure that the kids all get the same quality no matter what class period they are in. I can spend the class time helping students do their work instead of talking the whole class."

“That...um,” I was honestly stunned, “that sounds like a great idea.” This was the same Mrs. J whom I saw in tears because of the intimidation she felt toward having to use technology. “How can I help?”

She then set out highlighting her thoughts on how she wanted her lessons to run. I offered what assistance I could and she began her journey. At the start of school, she rolled out her new instructional program. Students used time at home to view her digitally curated lessons and returned to class to work on what would have traditionally been called homework. She is now able to individually help students on the actual work, rather than spending the whole class time talking about the work to be done.

One professional development event changed Mrs. J’s perspective. This veteran teacher, who was already accomplished at in-person instruction, changed her classroom model because of the new technology introduced and available to each of her students. The new instructional practice and presence of technology amplified her effect on student learning as she continues, each year, to modify her video lessons to meet the needs of new students in her classroom. Rather than teach each day and allow students to go home and struggle through the work, she decided to change the order of events. She stated once to the focus group team:

Students don't have questions until they are at home and working on the day's assignment. That's when I am unable to help them, and they struggle. So, using the tools available on the iPad, my MacBook and some third-party apps like Educreations®, I was able to change from delivery in the classroom to delivery at home from pre-recorded lessons. The students get the content and

information at home and then come in class to work on what would have been their homework.

Students and parents continually report that Ms. J's class is empowering and motivates them to complete their work even on difficult assignments because they know that she will be there to help them.

Building an arsenal of instructional tools and techniques makes it difficult for even the slowest adopters to resist forever. While there are many capable and motivated teachers in districts all around the world who will take it upon themselves to learn and experiment with new techniques, exposure to new pedagogical approaches may influence hesitant educators. When those types of teachers try new things, and leaders celebrate their efforts, they are more likely to work even harder to continue improving. The amount of attention Ms. J has received about her classes and the changes she made that she recently stated, "I was thinking about retirement, but with the way things are going for me I think I could teach a few more years."

The guiding principles of instructional program design, paired with a transformational leadership approach should drive a continuous process of training, support, evaluation, and revision of training program. As the devices, software resources, and faculty continue to develop and change, so should the plan to support and reinforce instructional change efforts. Hopefully, if the program is one of merit, these changes begin to diffuse into the broader environment and start redefining the educational system from what it once was, to what it *could* be.

I admit I grew frustrated when I did not see the integration of the devices permeate through the instructional programs at Mason County. It has been six years and still, I do not see the kind of widespread instructional shift I believe we are capable of instituting. I don't know if the frustration was with the fact that it wasn't happening, or with the realization that I was not in a traditional role of leadership that enabled me to do anything about it. Either way, it is clear now that the focus should be on the evidence of goals being achieved. While the instances may seem isolated, given time those achievements will begin to influence others in the building.

Alone, the devices amplify practice in teachers and students. That is why the instructional training and support are so crucial. Those components, paired with the device, can begin to bring about change in the instructional environment. But left alone, all you can hope for is that your best teachers keep getting better.

1:1 Lesson 5—Devices amplify current practice

A device in the hands of a capable teacher will amplify their effect on their students and the school environment. Your teachers are your best resource, but they need training and the support of leaders to have the best chance of success in your technology program.

Suggested Further Reading

Grant, M. M., Tamim, S., Brown, D. B., Sweeney, J. P., Ferguson, F. K., & Jones, L.

B. (2015). Teaching and learning with mobile computing devices: Case study in K-12 classrooms. *TechTrends*, 59(4), 32-45.

The authors investigate the effects of device adoption in K-12 classrooms through the use of case studies. Through a qualitative research approach, the applications of devices in nine purposefully selected classes are coded and themes described in their conclusions. Ultimately, research determined that teachers universally requested or sought out more training and that more support systems needed to be in place for teachers needing assistance.

Holcomb, L. B. (2009). Results & lessons learned from 1:1 laptop initiatives: A collective review. *TechTrends: Linking Research & Practice to Improve Learning*, 53(6), 49-55. doi:10.1007/s11528-009-0343-1

This article focuses on the research findings focused on the effects of 1:1 laptop initiatives. Reviewing and collectively analyzing the available research, the author poses that while the intent of many programs focused on increasing student achievement, there is no significant difference in scores present in the research. However, indications of gains in student attendance and choice in the avenue for learning has been seen and may indicate that change is taking place that could affect achievement in the future. The main conclusion is that successful 1:1 programs go beyond the devices and focus on professional development that builds teacher competency to capitalize on the influx of technology.

Jahnke, I., Bergström, P., Mårell-Olsson, E., Häll, L., & Kumar, S. (2017). Digital Didactical Designs as research framework: iPad integration in Nordic schools.

Computers & Education, 113(Supplement C), 1-15.

doi:<https://doi.org/10.1016/j.compedu.2017.05.006>

This qualitative research presented examples of how Danish teachers were integrating iPads into their classrooms. As part of a larger study, this investigation concentrated on collecting teacher interviews paired with classroom observations to develop their clustering of findings. It was revealed that creativity, collaboration, and product development were increased in the classrooms observed. In the exemplary classrooms, teachers felt adequately trained and tried new things to find methods of use that worked for them and promoted their students' success.

Persist

The first five lessons were the hardest to learn. Through years of humbling experiences and daily frustrations, the program continued to grow and mature. Mason County is not a perfect 1:1 program, but it is one that has survived changes in leadership, district vision, and chosen device. We have had and will continue to have, issues with access to appropriate professional development programming and schoolwide technology integration. However, persistence has created what seems to be a sustainable system and is the longest running school 1:1 program in our area of the state. A transition to Chromebooks in 2017 allowed the full implementation Google's G Suite of applications and productivity resources. I see the instructional change efforts of some teachers and continue to be amazed by the changes that have resulted.

The final lesson is one of encouragement; it simply tells us not to give up when things are difficult. It is meant to remind us all, especially me, that tough times don't last forever. As long as we keep working and trying to make our 1:1 programs the best they can be, we will see results.

The best stories come from some of our students that have been affected by the incorporation of technology in the classroom. LS was one such student. Traditionally in focus groups, Dr. C tried to get to know his participants and asked questions about them and their aspirations after high school.

“I’m going to study filmmaking,” he told Dr. C about his plans.

Dr. C was shocked that this student in a small, rural school would have that aspiration. “Why do you want to do that? What has caused you to want to pursue that area of study?” he questioned. LS replied:

It was in Mr. Jackson’s class. In that class we made National History Day videos. I had never done anything like that--ever. It scared me to death. But I had the iPad, and we were shown what to do. So, I made my video, and it was great. I had never done anything like that, and I would have never imagined I would be able to do something like that. But when I did it, something clicked. I knew it was something I wanted to do. I knew what I was going to for my career. Who would have thought a kid from Mason County could make movies? Now I know I can, and it was because of Mr. Jackson’s class!

Since the time LS was in the History class that made those videos, he has produced training videos for a local branch of a multinational corporation, won recognition from the regional chapter of the National Academy of Television Arts and Sciences and provided our school district with videos for outreach campaigns. He will be attending a state university and, indeed, studying film.

There is nothing better than hearing this type of story from your students. It wasn't the device alone that created this effect, and it wasn't my ability in the classroom that did it either. It was the opportunity that the presence of devices gave to me in my class, paired with the specialized professional development I had on the National History Day program, which enabled this project-based learning event to take place. That is the power of education. One activity, one lesson, or one project could serve as the means to change a students life.

Another pretty amazing development comes in the form of an attitudinal shift in the faculty of Mason County High School. For us at Mason County, the innovative ideas that began to change the school structure also began changing the attitudes of teachers and students regarding learning. We talk less about grades and assessment scores now and instead focus on the progress of individual students through their learning program. This progress-based evaluation of student learning has led to a district-wide movement to redefine the competencies and skills our graduates possess and are required to demonstrate before graduation. We're calling it the 'Royal Diploma.'

'Royal' because we are the Mason County Royals and 'Diploma' because it is intended to be a final step toward graduation, but it will not take the place of our traditional diploma yet. With this program, the intent is to provide students learning opportunities to develop life-relevant competencies and skills during their school career, and by the end of their time in our system, they would essentially 'defend' evidence of their learning in front of a review panel. This development has been met with mixed reactions, but many do not recognize the fact that the plan takes little additional work on the part of teachers and students. The true desire is to match the curriculum taught with relevant 'soft skills' that are needed when transitioning into the real world. Where a traditional diploma simply declares that a student has at least met the minimum requirements for graduation, the new 'Royal Diploma' will be an addendum that attests to the student's social and communicative skills as well as character traits that set them apart from their peers.

We just completed our first round of senior presentations in the Spring of 2018. All year long we had heard protests from both students and parents declaring that this was 'unfair,' and 'unnecessary.' We persisted and received several positive responses after students got through the process. RN was an outspoken critic of the program, but sent this email after having delivered her presentation:

...I want to express an endless amount of gratitude to you, and the teachers who helped facilitate and carry out the defenses for us...I can genuinely say the opportunity to present myself in front of the panel was one of the most fulfilling and liberating experiences I've ever had.

To sit down and explain to panel members the things I had overcome to get where I am today, was such a great feeling. Your genuine curiosity and engagement with my presentation made it that much more surreal to reflect upon.

My senior defense was a highlight of my senior year, and I'll never forget that feeling I got when I shook the hands of my panel members and gave them a one-on-one insight to who I am, my goals, and my experiences.

Thank you,
RN

While not a direct cause of device implementation, the creation of this program correlates to the change in the mindset present in the school system. The attitudinal shift that took place was the result of the new types of learning activities created from the devices' presence and the types of alternative assessments taking place in many of the classrooms. As this program continues to develop, I believe that students in the future will feel just as empowered and validated as RN. One can hope that the effect is widespread and long-lasting.

Any institution that is pursuing a 1:1 device program has the intent to change their learning environment. What resulted in six years at Mason County was a change

in the ideas and attitudes that became the driving forces of the institution. The technology was the beginning of this change and is now an integral part of our system. This systemic change addresses the larger pedagogy of education in an attempt to affect long-lasting change (Joseph & Reigeluth, 2010), and has a greater possibility of diffusion because the likelihood of success grows as our whole environment experiences a paradigm shift (Rogers, 2003). What continues to develop is our understanding of what learning looks like in a 1:1 environment, how best to address the changing technologies and new needs of constituents, and how to continue to ensure that the students are the focus of what we do every day.

Lesson six can help give hope during difficult times. Keep your vision and goals as your focus and continue to develop your program. The impact that you have or can have on the lives of students and their futures is the reason you're an educator. The desire to impact the lives of young people is what makes the profession a calling, and it should always be a chief goal of improvement programs.

1:1 Lesson 6—Persist

Keep learning. Keep changing. Persist through the tough times. Allow your students and teachers to amaze you every day.

Suggested Further Reading

Joseph, R., & Reigeluth, C. M. (2010). The systemic change process in education: A conceptual framework. *Contemporary Educational Technology, 1*(2).

The authors provide a conceptual framework for institutions, policy makers, and researchers to follow to understand the wider effect of the paradigm shift required for the systemic change process. The authors' experiences and related research are combined to develop and describe the six-element framework. Finally, recommendations are made to help inform change-agents in instituting systemic change to provide lasting educational reform.

Rogers, E. M. (2003). *Diffusion of innovations* (Fourth Edition ed.). New York, NY: The Free Press.

This book is seen as the cornerstone work of how innovations diffuse into a population or society. Every major industry is investigated, with examples of the ideas or innovations that have diffused given to highlight one of the aspects an innovation must have to achieve widespread adoption. While not specifically related to educational technology, the aspects required for diffusion relate to an innovation's ability to systemically change an environment.

Conclusion

If you have read until this point, you have gained some insight into what it was like, for me, in a 1:1 educational technology environment. Now, the program with which I work may not be your typical, by any means; but the lessons I have shared should serve you well in your endeavor to improve or conduct research in a device-rich environment. Hopefully, I have used my experiences to contextualize the lessons and possibly offer some inspiration; and a little humor.

But don't just take it from me. The longitudinal study conducted by Dr. C in the first five years of implementation shared many of the same insights that you see here. The qualitative approach allowed for those teachers and students impacted by the program to deliver their perspectives, which the research team then used to make suggestions for future development and programming.

For five years, Mason County's program has continued to develop into a program of worth. With whole changes to classroom practice by individuals, increased oversight of device care and maintenance as well as the growing popularity of project-based learning activities using technology tools available on the iPad, there is much to celebrate. Across the four years, surprisingly, teacher and student perceptions mirrored one another. Items that consistently emerge as concerns over the course of the four years study include the following: gaming, classroom management, and teacher usage. However, data also indicated many things that can be improved.

The level of planning and commitment to detail for the rollout was necessary to begin the program. However, the lack of momentum carrying the program through to instructional change was not present. Given the abrupt change in district leadership in 2012, focus on the one-to-one program was placed to the side as new leadership was engaged in other areas. Because of this, and because the 2016-17 school year represents the final year of Mason County's iPad lease, the researchers suggest that any continuation of this or any other 1:1 program take these suggestions into their planning:

1. Focus more directly on building instructional changes that adhere to a timeline. Evaluate the progress periodically.
2. Have a dedicated official responsible for the administration, training, support and evaluation of educators within the program to ensure continuity and program success.
3. Organize the program in such a way that it is the responsibility of all faculty to have the program succeed.
4. Dedicate time and capital each year to high-quality professional development surrounding technology-driven instructional design and iPad implementation.
5. Continue to offer meaningful opportunities to involve students in the day-to-day management of program (help desk, mentoring etc.).
(Curry, Jackson, & Kallas, 2017)

No, we don't have a perfect program by any means; and I have made many mistakes along the way in my interactions and reactions to students and teachers. The practice of reflecting on the past six years has made it clear what should be done when others set out upon a similar journey. Specifically, leaders should:

1. Treat the devices as tools, nothing more.
2. Develop the capacity for leadership and problem-solving in their constituents. This way, problems can be solved collaboratively.
3. Believe in their best teachers' ability to innovate.
4. Dedicate time, money and resources to the training of faculty on device integration practices.
5. Find opportunities for teachers to amplify their practice.
6. Persist through the tough situations.

I don't share this information with an attitude of regret, but rather, as a means to show how far we have come in our efforts. As the program has matured and become a part of who we are at Mason County High School, it has become part of who I am as well. I'm still the 'Tech Guy,' and I work every day to make sure that my program is 'one-to-one,' instead of 'one-to-none.'

Suggested Further Reading

Curry, J. H., Jackson, S. R., & Kallas, M. (2017). *Leading change, but is anyone learning? A four-year study of one school's 1:1 iPad implementation*. Paper presented at the Association of Educational Communication and Technology (AECT), Jacksonville, FL.

This five-year, longitudinal study presents information on student and teacher perceptions of the 1:1 iPad program at Mason County High School. Using the information received from focus groups, as well as presenting some statistics relating to accountability and testing, researchers give the reader a look at what the program meant to those directly affected by its implementation.

Additionally, they offer their recommendations for program improvement and for further consideration.

VITA

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