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IMPLEMENTING BRING YOUR OWN DEVICE AND THE PAPERLESS CLASSROOM: A CHANGE LEADERSHIP PROJECT

Tamara Cornwell

Educational Leadership Doctoral Program

Submitted in partial fulfillment

of the requirements of

Doctor of Education

in the Foster G. McGaw Graduate School

National College of Education

National Louis University

December, 2015

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

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

- Program Evaluation
- Change Leadership Plan
- Policy Advocacy Document

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

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

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

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ABSTRACT

My journey through the implementation of an action plan for a Bring Your Own Device (BYOD) program is presented in this research document. The action plan incorporated the addition of industrial certification standards for technology integrated into the core curriculum at a public middle school (grades 6-8) during the 2014-2015 school year. Technology skills became a part of students' daily learning opportunities. An eSTEAM Academy provided interested students and teachers with technology training and skills for classroom inclusion and blended model of face-to-face instruction enhanced with technology in a "paperless" classroom environment. This is an account of our successful journey in the ever changing, ever challenging pursuit of technology infused 21st Century educational excellence.

PREFACE

I served in the position of Assistant Principal at a 6-8 public middle school during this Change Leadership Plan (CLP) process. The plan centers on the establishment of a Bring Your Own Device (BYOD) program that additionally integrates industry certification standards curriculum within the core course. I took on the leadership of championing this endeavor. As a professional educator, I follow exciting new ideas, technologies, instructional strategies, educational trends and legislation.

The legislation addressing high school level career preparedness, the Career and Professional Education Act (CAPE), (Florida Department of Education, 2015), was a clear sign to me of emerging opportunities. The CAPE Act mandated that high school students participate in career shadowing and career exploration. State legislators subsequently secured a revised CAPE Act addressing middle school students as well. There was a push to teach technology and promote industry certifications in middle schools in our school district. To prepare for imminent change and to provide our students with the tools they needed for their future success, I felt the urgency to act. Since additional funding to implement new initiatives was nonexistent, a BYOD program seemed to be the best possible course.

In 2015, the state passed Senate Bill 850 that mandated that by 2018, 75% of all middle school students would need to have achieved a technology based industry certification. This timeline put pressure on our school. We lacked the technological capacity to implement the mandate (Florida Department of Education, 2015). In addition, the state department of education initiated the use of on-line platforms for high stakes

student assessment administration. Technology skills had to become a part of students' daily learning experience.

In response, my school initiated the *excellence in Science, Technology, Engineering, Arts and Math* (eSTEAM) *Academy*. Beginning an eSTEAM Academy seemed to be the best solution for providing a technology rich environment for interested students and teachers with the ultimate goal of establishing a blended model of face-to-face instruction with technology enhancements in a "paperless" class environment. We searched for appropriate, established technology integration standards to guide us. By adopting the established state Industry Certification Technology Standards, we gained not only technology standards to help guide our program and blend with core curriculum standards, but also the means for students to achieve workforce-recognized certifications.

The challenges described above form the context for my journey in change leadership. Through this experience, I have come to reaffirm my belief that with a solid vision, a strong leadership team, cross training and meaningful collaboration, a challenge can be not only an opportunity, but also an incredible success. One of my favorite quotes is from *Resonant Leaders* by Boyatzis and McKee (2005): "Resonant leaders are stepping up, charting paths through unfamiliar territory, and inspiring people in their organizations, institutions, and communities. They are finding new opportunities within today's challenges, creating hope in the face of fear and despair" (p. 2). I believe education is one of the most fulfilling of all career choices because each day educational professionals have the opportunity to facilitate the fulfilled potential of our students. Resonant leadership leads the way.

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SECTION ONE: INTRODUCTION

Designing a classroom for the 21st century learner is a tremendous challenge. It is one that educator's face if they are preparing their students for the future job market. Educators are tasked with envisioning what our student's future will hold in jobs that have yet to have been designed, using equipment that has yet to be invented. Current classroom teachers are faced with the challenge of student's use of technology being of second nature. A huge shift in communication has occurred. In *The Global Achievement Gap,* Tony Wagner refers to this generation of learners as the "Net Generation" (2008, p. 170). Wagner states, "The desire to multitask and be constantly connected to the net and to friends as well as the hunger for immediate results, influence how young people today interact with the world" (p. 178). Our problem is that often a student's technological experience and knowledge is beyond an average educator's skill set. According to Brown and Warschauer (2006), "A key factor constraining effective use of technology in schools is teachers' limited expertise in the professional use of computers" (p. 600).

To envision a plan for change, Wagner, et al. (2006) *in Change Leadership A Practical Guide to Transforming Our Schools,* identifies what is needed for organizational change to occur: "Leaders must recognize the cyclical aspects of change and the systemic nature of organizations, and must have the flexibility to adapt where necessary to meet their goals" (p. 154). In Appendix A, I list my "As-Is" diagram. This Wagner et al. (2006) diagram for planning change describes my main problem as the lack of technology training for teachers, when beginning a Bring Your Own Device (BYOD) program. My school successfully implemented a BYOD program last year. My district has found it difficult to keep up with the need for continuous maintenance and upgrade of

district technology to use within our classrooms. Implementing a BYOD program allows students to bring in their technology devices for use in the classroom. Maintenance and upkeep of the device are then the student's responsibility. The school creates a contract with the parents and students on the proper use of technology as an educational tool. The parents understand that their student is responsible for keeping up with their device, and is also responsible for any damage or loss. The contract covers misuse of the device and includes using a device for inappropriate texting and picture taking. A device can only be used in a device permitted zone, which is labeled in a classroom on the white board. If a teacher is allowing device use for the day, they have a magnetic sticker on the board indicating that on this day a device may be used. If it is a 'no device use' day, the teacher turns the sticker over indicating that there is no device use within the classroom.

The rationale for technology use in the classroom is to try to prepare students for jobs that are yet to be created. In Wagner's *The Global Achievement Gap* (2008), he describes this as "the gap between what even our best suburban, urban, and rural public schools are teaching and testing versus what all students will need to succeed as learners, workers, and citizens in today's global knowledge economy" (p. 8). I refer to this new age of learning and teaching as being on the frontier of learning. The teacher is the guide, leading their students through uncharted territory, moving forward to unknown destinations, teaching processes that are constantly filled with change and new challenges. It is an amazing time, and there is need for flexible teaching on mastering standards through project based learning and using ever changing and updated information to apply new knowledge. It is more important than ever to teach our students to become critical thinkers and problem solvers. This cannot be done through textbook

learning. The digital age allows mistakes in printing in a tech-book to be updated in mere seconds rather than waiting for a new addition, or sending out an updated pamphlet, which lists mistakes, or changes that were found after the book went to press.

The "To-Be" diagram (Appendix B) is my vision of how to change the process of teaching within the classroom and eliminate the fear of using technology as a learning tool, rather than just a tool for communication purposes. Further planning is included in the Strategies and Action chart (Appendix C). This chart is a list of strategies and actions from my "As Is" and "To Be" with a focus on best practices in professional development, leadership and communication strategies.

Statement of the Problem

The problem that I perceive at my school is to overcome the obstacle of a teacher's limited technological expertise, and to grow the teacher's understanding of how to use technological devices effectively in their classrooms, striving to work toward the creation of "paperless" lessons. My vision in these "paperless classrooms" is that student outputs (student projects) will align with the outputs using an Adobe, Solid Works or Microsoft product in a textbook free atmosphere.

My term "paperless" means that students use the Internet for research, and work in collaborative learning groups as critical thinkers and problem solvers facilitated by a classroom instructor. Paperless methods use as a best practice of as much classwork that can be done using a technology device versus a paper version is implemented. An example seen in a regular classroom versus a paperless classroom would consist of a regular class project assigning a student to draw a paper poster representing what they had researched. In the regular class, the student would use art products and poster board

to create this poster. The student would then share the finished product in the classroom. In the paperless classroom, the instructor would challenge the student to create a Glogster (interactive on-line poster) or Prezi (interactive presentation) to present the material. The electronic posters would be interactive and have the student think about color, design, font and presentation to actively engage students in the process of learning. The projects could be shared outside of the classroom as they were being created, and students could learn from one another by sharing in collaborative electronic sessions on applications such as Google Docs or Edmodo. This classroom becomes a competitive climate in which students learn new skills to try to design a better product. In these engaging sessions, students comment on each other's work for better collaborative pieces and receive grade credits for this collaboration.

The student presents the final product to the classroom and the rubric might include not only the standards the student had learned but might also assess a new product the student found while creating the electronic project. These electronic projects seem far more engaging and in a recent pilot of a 'paperless' classroom, one of my student's shared that he did not realize how much more time he was putting into a project because it was so much fun learning, sharing and competing on who could create the best product

Rationale

The reason I chose this problem was the need to move our students forward as 21st century learners. Our nation is behind in Science, Technology, Engineering and Math (STEM) education. According to The STEM Crisis, "Jobs in computer systems design and related services, a field dependent on high-level math and

problem-solving skills, are projected to grow 45 percent between 2008 and 2018" (par. 5). Our nation is getting further behind in these fields, and we are losing our competitive edge in comparison to the rest of the world. Research by Brown, Brown, Reardon, and Merrill (2011) support:

> The proponents of STEM education believe that by increasing math and science requirements in schools, along with infusing technology and engineering concepts, students will perform better and be better prepared for advanced education or jobs in STEM fields (often referred to as the STEM pipeline). The lasting result would be that the United States would again rise to the top of international rankings. (para. 1)

All school, district and national educators must rise up to this call for action and increase our students' application of technology within our classrooms. As educational leaders, we must improve our students' math, science and engineering skills in order to remain a competitive nation and prepare our students for the jobs of the future. In *The Practice of Adaptive Leadership*, (2009) Heifetz, Grashow and Linsky refer to this drive stating, "Adaptive leadership is the practice of mobilizing people to tackle tough challenges, and thrive" (p. 14). This is indeed a tough job, but doing nothing stops movement, more than stagnancy.

Another urgency lies in the fact that all of our students are taking end of year and end of course assessments on computers. The need to grow students in technological skills will better prepare them with the tools needed for successful test taking strategies. The greater time spent on a student knowing how to

manipulate a keyboard or highlighting text, the more this skill becomes habit. If a student spends more time thinking about hunting and pecking out letters in order to respond to a specific prompt, he or she will have a loss of time needed to think about what to write about the prompt. Students practicing computer skills will be essential, as more State and benchmark assessments move toward being taken via a computer.

Goals

The goals of my change plan are also listed in my "To Be" diagram (Appendix B). I hope to create a path for the application and growth of such programs as Science, Technology, Engineering and Math (STEM) inclusion into academic "paperless" classrooms, with little financial impact. If we allow our students to use their own devices in the classroom (BYOD), they will be able to explore current information and apply current factual data to project based learning outputs. The permission for students to use their own device will help cut the cost of a district constantly having to update current technology. This cost savings will give district the needed funds to be able to designate dollars to the support of infrastructure and the ability to purchase gains of needed bandwidth for greater technology speed and reliability.

I believe the inclusion of technology within our core curriculum classes will grow our students as critical thinkers and problem-solvers. Perhaps the potential of a teacher's lack of technology skill will be an asset, for the students' like to feel empowered in the teaching of others, whether that teaching is limited to their peers or includes their teachers and family members. Many educators aim

for the highest levels of learning as presented in Bloom's Taxonomy Charts including analyzing, evaluating and creating. The higher level of learning incorporates a student's ability to teach others. My goal is to strive for this increase of learning by raising levels of engagement in growing collaborative problem solving opportunities for students within their core curriculum courses.

The goal for the teacher is to grow as a facilitator of their classroom and give the learning responsibility up to their students. Teachers in a technology-enhanced classroom assign cooperative projects that develop students' learning. A teacher asks higher order questions and provides students with ample time to seek the answers, develop problem solving and critical thinking skills, and formulate possible solutions. Students learn technology skills in word processing, power point, excel and other programs as they reinforce the core curriculum standards.

The rational for developing a career academy (eSTEAM) was to align our technology goals with recognized industry certification. Appendix D lists portions of the State Senate Bill that speaks to the inclusion of industry certification within middle schools. One of the industry certifications we challenge our sixth grade eSTEAM students with is called Internet and Computing Core (IC3) Digital Literacy and is a Certiport product. This certification is recognized by the global community as a standard for digital needed knowledge. The Certiport IC3 is a three-part certification, which includes Computing Fundamentals, Key Applications and Living Online. Giving teachers these IC3 standards as a technology goal helps to standardize what technology

each teacher is focusing on and creates common language and skills amongst students. eSTEAM teachers meet once a month to discuss what works well in their classrooms and share program advice and offer support to one another as they discuss technology challenges. I believe the inclusion of technology will result in higher student enthusiasm and will result in greater student assessment scores due to better mastery of core standards. I feel there is a direct alignment between student engagement and mastery and I hope this study proves this to be true.

I continue the goal of sharing results with my parents, school district and community members to report the results of infusing technology into core curriculum classes. I consistently ask my teachers to provide school and district training opportunities on the pedagogy needed for classroom technology use, to assist with developing my teachers as leaders and to spread the program opportunities to other schools. I frequently communicate with parents to build their opportunities to learn from their students and with their students through providing parent universities and providing evening assemblies for communication opportunities. Wagner et al. (2006) shares, "To generate the much needed momentum and urgency for change, people need to fully understand the why behind the journey" (p. 138). I feel providing opportunities for each stakeholder to become a part of this change plan will sustain this plan and allow for future growth through the building of trust from all stakeholders in modeling the importance of respected participation.

Demographics

I gathered the demographics of my school district by comparing the 2011-2012 Florida Department of Education School Accountability Report (2012) with the New American Foundation, Federal Education Budget Project's data (2012). A total of approximately 45,222 students attended my district's public, special and charter schools. These populations included a racial demographic designation of approximately 52.8% White, 28.3% Hispanic and 14.8% African Americans; the total approximate minority ratio was 45.1%. The overall approximate poverty level was 22.9%; the approximate free and reduced lunch enrollment was 53.7% while the overall approximate socio-economic status (SES) was 57.4%. The approximate student program designations were 9.6% ELL, 17.0% ESE, and 4.8% Gifted. The approximate overall district-operating budget was $420,327,000 with an $8,942 per pupil expenditure. The graduation rate was 76.8% at the time of this study.

The achievement data in 2011-2012 for my district include the following percent listed as satisfactory or higher in the following categories: 54% in reading, 52% in math, 77% in writing and 42% in science. Ninety nine percent of all eligible students were tested and determined as satisfactory with a district grade of a B, which dropped to a C in 2012. This drop in grade and low science scores have happened concurrently. Included in this drop in grade more students are being required to take computer assessments, yet basic computer skills have not been offered and students lack many of the basic skills needed for test taking needs. I believe the need to include this fact in my demographic data indicates

the districts need to prepare pour students with basic computer skills and is the reason I have begun these efforts within my change leadership plan.

Exploratory Questions

I intend on using my actionable research questions to drive my change plan (Appendix G) to better lead my school and stakeholders to making this change a new culture for school wide implementation. My primary research questions include:

1-What effect might the institution and use of a BYOD – technology immersed program, for the selected students, have on their achievement grades, compared to other students who are not involved in a technology immersed classroom, and therefore do not use technology in their classrooms to the same extent as measured by the results of the Benchmark Assessment and State Achievement Test?

2. What do the participants (teachers) who are involved in a BYOD – technology? immersed program at one middle school report as working well in the program?

3. What do the participants (teachers) who are involved in a BYOD – technology? immersed program at one middle school report as not working well in the program?

4. What suggestions do the participants (teachers) who are involved in a BYOD– technology immersed program at one middle school report as suggestions for improving the BYOD– technology immersed program?

As a school-site administrator, I am also interested in other practitioner issues and questions related to the implementation of this new program at our school, such as:

5. What implications for district-wide application of a BYOD– technology immersed program are revealed in the study of this BYOD– technology immersed program at one middle school?

6. How will students who cannot afford technology, compete academically with students who can?

7. Is there a cost savings for the school (and eventually for the District) in using BYOD?

8. How many participating academy students will successfully pass the Industrial Certification Test?

Conclusion

To create a visionary solution, I need to monitor specific change categories and not alter my overall goal designations. Although my leadership plan should remain flexible to account for uncontrollable situations, my communications should also remain goal oriented and support the growth of technology use within core classrooms. I will need to reinforce my goals by monitoring data and researching other programs to reinforce and substantiate the need for this change to be implemented.

The “As Is” and “To Be” diagrams (Appendix A and Appendix B) helped me to create an overall actions and strategies plan (Appendix C) and see the challenges in the contexts, cultures, conditions, and competencies. This activity established a plan for moving forward. The “Settings” category in which I researched my districts demographics and statistics helped me to see the substantial need for my change plan. The change plan began when I saw the

scores begin to decline and I believed there was a missing portion between the way students were being tested and the manner in which students were being taught. I as well noticed teachers were not changing their teaching methods, although they were questioning why the scores were continuing to decline. Teachers continued to do what they had always done in the past, for my school had students that were high achievers, but as the test changed from pencil paper to computer based, I felt a change needed to occur in how my teachers presented their material.

I further noticed that many of my students chose technology as an elective and many students owned technology devices in the form of cell phones and reading devices and chose to use these devices whenever allowed. I thought that by including technology into the teaching methodology, I might see an increase in student engagement and class participation due to students' interest in using technology as a tool for learning. I believed an overall effect might occur as students' engagement increased so may the students' achievement increase. I hoped an immediate effect would derive from an increase in technology use within the classroom providing students with a greater comfort in using technology every day. This daily technology practice would thereby enable students to focus on "what" was being tested, using a computer, rather than being worried about "how" to use the computer during testing. This immediate effect would occur from comfort of use. I approached my teachers with this concept and they thought this was a reasonable hypothesis.

In my "As Is" analysis chart, I listed the culture of fear my teachers had

in including technology into their classroom processes. They worried about lack of student devices, how to manage students using technology and time for training on how to use the technology. Some of my teachers agreed to overcome their fears and join together to form an academy. My "To Be" analysis chart listed the industry certification within "Context"; this career academy (eSTEAM Academy) process gave direction to the technology, which gave the teachers greater comfort. It was not just a way of saying "Okay, we will be testing with technology so use technology in your classroom". The eSTEAM Academy had an application process in which students had to apply as an academy member. Through this application process students who liked to use technology would be able to do so on a daily basis. There were requirements that had to be met within a career academy that included industry certification standards to be mastered and tests to be accomplished. By passing of these tests, students would gain business level certification, provide the school state school grade points and provide dollars to the school from district allocated state funding. The teacher will gain a revival of student excitement in how they are learning and give teachers the ability to further prepare their students for the 21st century work force. It is my overall hope that this application, has create the passion to grow students' as critical thinkers and problem solvers as well as revive the excitement of teachers and give them a renewed breath in the skill of developing engaged lifelong learners through development of technology enhancements.

SECTION TWO: ASSESSING THE 4 C'S (AS IS)

In *Change Leadership: A Practical Guide to Transforming Our Schools*, Tony Wagner et al. explain the 4 C's in the categories of contexts, cultures, conditions, and competencies, (2006). These 4 C's helped to compare how a program or system currently enacts the "As Is", along with how a program or system might become the "To Be". A copy of my As Is (Appendix A) and "To Be" (Appendix B) diagrams are included in this Change Leadership Plan. The "As Is" and "To Be" Venn diagrams were a helpful tool in development of my plan and helped me to consider the breakdown of the 4 C's.

Context

The "As Is" Context organized the challenges that help support the problem that I am investigating. My first Context bullet was concerning a Teacher's fear of using and monitoring technology, thereby prohibiting student growth as 21st Century Learners. "Motivating young people to do their best in school today requires teachers to re-think what and how they teach as well" (Wagner et al. 2008, p. 189). Our teachers must overcome their fears of the unknown and begin to develop engaging classroom atmospheres in which students can grow as critical thinkers in collaborative ways. In the school in which I am an administrator, I have observed different degrees of a teacher's understanding of technology use within the classroom. Some teachers consider that using an Electric Light Machine Organization (ELMO) device to demonstrate a concept in lecture style to be a substantial use of technology in the classroom. They assume this limited use is at least enough to warrant an 'effective' rating on their teacher observation. At the opposite end of the spectrum are the teachers in my school who have students using technology for discovering or qualifying facts. These teachers have students grow

in their technological presentations by posing open-ended, high order questions. Students use collaborative, critical thinking methods to investigate the solution with the support of factual knowledge gained by using a device for verification of data. In these highly engaging classrooms, rarely do students asks to use the restroom, visit the clinic, or create another reason to leave class. These classrooms motivate students to develop creative solutions and strive to achieve greater understanding and development of their technology skills. Whether it is a teacher's fear that students know more about technology, or the idea that there is no time to develop technology skills with such stringent requirements of the common core curriculum, there is still an observable resistance of teachers willing to develop lessons to incorporate technological use.

Another aspect to the context is a lack of updated computers for student use. It has become an extreme financial burden for the district to continue to purchase new replacement computer devices every five to seven years, which is the life of a current computer used for educational purposes. "The average desktop PC has a functional lifespan of roughly two to five years maximum. The length of the lifespan greatly depends upon the type of system purchased, advances in hardware components and changes in the software that we run" (Articles base, 2009, para. 1). With the lifespan of the average computer being so short it was financially impossible to keep up with upgraded computers. The BYOD program eliminated this need for the families would be responsible to upgrade their own computer as need, skill and use demanded.

Part of the reasons for these upgrades are derived from enhanced educational programs purchased for remedial or practice purposes. These upgrades often require additional hardware capabilities. The fiscal burden of the upgrades and the cost of the

hardware are an over-whelming cost to my district. To add to this cost is the need to purchase the infrastructure for wireless use needed for a laptop cart use in the classroom. The funding limitations usually result in fewer computers being purchased for student use. With fewer computers being available, fewer classrooms can have access to the limited number of computers and it becomes frustrating to teachers to schedule for computer time. Although my school recently allowed for an inclusion of a Bring Your Own Device program, these educational programs may not be loaded on a student's personal device.

My school district is currently operating under a financial shortfall. The State has identified our district as having fiscal mismanagement, and has mandated additional financial controls and measures to restore the district to financial health. According to the local paper (Name of paper, some words and cite omitted for anonymity purposes) :

> Audit findings already include more than $4 million in questionable sales tax spending, another over $1 million in questionable ad valorem tax revenue spending and another $1 million in questioned spending from construction bonds, state board of education bonds and other funds earmarked for capital projects.
>
> The school district also failed to return more than $700,000+ to the state as required, according to the audit. The school district also reportedly misspent money from the workers' compensation fund leaving it with nearly a $2 million deficit, according to the audit.

The lack of dollars not only contributed to inability to purchase needed technology but also to a reduction of staff, which included school technological

support staff. This lack of technology staff limits the day-to-day support needed to grow new technology programs. Due to the newness of technology implementation, teachers do not have the comfort or knowledge to problem solve challenges. This becomes a tremendous frustration when a teacher plans to use technology and it does not work properly, and there is no support for assistance in the classroom.

The last context bullet in my As Is diagram (Appendix A) is developing a master schedule to try aligning students' schedules to an academy schedule in which students attend the technology-enhanced courses. Building the master schedule with the other normal schedule restraints can be very challenging and requires multiple meetings to build a balanced schedule. This accomplishment must use the current staff allocations and encourage teachers to develop academic lessons with the inclusion of technological enhancements.

Culture

The culture bullets reinforced much of what was written in the context. Teachers seem to fear technology use in the classroom. It may be the fear of student's technology knowledge being greater than the teachers, and teachers wanting to lead the classroom rather than facilitate learning. Once the teacher gives up the need to grow students into developing learning techniques and move from rote lecture, the teacher may find the transition enlightening. A challenge will be in creating the staff development to move the teachers into what, in *Change Leadership,* Wagner et al. calls the goal of "improving teaching and learning" (p. 98).

In the recent development of a paperless classroom, I have observed that teachers do not have skills on how to monitor appropriate computer use within their classrooms. They do not walk about the class making sure that students are using devices appropriately for educational purposes. They are often surprised when students quickly move from using technology for educational purposes to an inappropriate communication or entertainment use. Another aspect of technology pedagogy for teachers is to learn when to download material so as not to cripple the bandwidth limitations caused by too many devices requiring the internet at the same time. If teachers understand and maintain a minimum internet use policy, then there will be less computers being knocked off network, requiring the waste of time to continuously restart.

Upgrades of computer programs and systems require time to relearn the changes implemented by the upgrades. This often becomes frustrating to a teacher user and the teacher gives up the challenge for a more familiar lesson. Teachers often refer to the tried and true method as "dusting off of the lesson plans," for the familiar is a far more-safe and secure place to hide. The time element to learn a new applications naturally leads to frustration, which limits a teacher's willingness to remain flexible to change.

Conditions

Time seems to be the largest enemy. Due to union bargaining, time for teacher training is limited to 45 minutes per week. These limitations greatly impair the ability to provide for adequate training for parent/student. While the training can be voluntary, my school site union members often send out

messages that warn teachers not to give of their free time, for it is unpaid. The union further warns that if you are volunteering, administrators might consider this time as necessary, and infringe on negotiated time limitations.

As previously mentioned under the context bullet, the condition of lack of funding has greatly limited needed technological enhancements. The lack of these consistencies disables programs from running properly and can even limit communications from district to school. This occurs when the district, or only a few schools, receives the upgrades and other schools wait for upgrades, which greatly limits effective communication.

Our district is currently working on the infrastructure and the improvement of bandwidth, including installation of needed radios and hubs. Currently, only Title 1 schools have the dollars needed to install these upgrades. The servers will not be available for the non-title one schools for two more years. The difference between my school's bandwidth at .1 gigabits and a Title 1 school's bandwidth at 10 gigabits is a .9 gigabit difference in the speed and efficiency of the information and use.

The final culture bullet is the lack of technological support from the district to the schools. Much of this is due to current budget constraints. It is also been a huge hurtle when trying to make a move forward for teachers to use technology within their classrooms. A teacher will indicate their willingness to incorporate technology, but when it is time to begin the lesson, without support for possible technology problems, the teacher becomes frustrated and gives up due to this lack of support.

Competencies

Most of the teachers on my campus have been teaching for ten years or longer. Out of the fifteen core curriculum teachers, only three are new to the district. Most of the teachers in my school had very limited use of computers while they were in college. They have a lack of knowledge of how to use technology in the classroom. This lack of knowledge of use applies both to the use of programs and to methods for monitoring internet use. If teachers do not learn when to download programs, rather than relying on the internet to run the programs from, they will use too much bandwidth and disable the ability for speed and continuity. All of these competency limitations can be overcome through staff development. The time to efficiently train existing staff and continue to train new staff is a huge undertaking. This must be overcome by encouraging teachers to volunteer to explore new opportunities to use technological options and share their findings.

According to my previous research on student engagement (Cornwell, 2015), higher order thinking and collaborative problem solving skills will increase if students are given the opportunity to explore gained knowledge with technology. If a teacher uses this tool, they are not limited to the material within a textbook that becomes outdated the day the book goes to press. Recent data and facts are at their student's fingertips, so if new knowledge is learned, it can be applied to current learning practices.

Conclusion

To transform and develop an institutional change it is essential to place

the needed tools in the hands of the people who will be involved with this change. With a Bring Your Own Device (BYOD) program, schools will have the tools needed for implementing success. Having the computers is only one-step to proper use by students and teachers. The infrastructure must be in place as well as an understanding of the responsibilities of using devices for educational purposes. Teachers, Parents and Students need extensive training on appropriate classroom use. Appendix E in this document contains an expectation of usage policy and Appendix F includes an example of our BYOD policy. Both of these documents helped with establishing appropriate classroom use.

Changing these devices from instruments used for communication and entertainment to educational tools is a big step. This change is needed if technology used for educational purposes becomes part of the culture. Training and flexibility are needed in order for this change to be successful. Teachers will need to learn when they are using the bandwidth and to monitor the use. If teachers are taught to download materials prior to class, then the need for internet use will be greatly reduced. Teachers can provide this same information to their students so that bandwidth use can be greatly reduced. Students will be inspired to discover new and greater use of technology use to learn. They will research what has been made available and begin to create their own versions and programs to share with others. These types of discoveries will grow students' abilities in critical thinking and problem solving skills, as well as collaboration with their peers.

SECTION THREE: RESEARCH METHODOLOGY

The major factors of my As Is - four C's model include the fears and concern that teachers, parents, and administrators fears about student use of electronic devices in the classroom. I propose to question teachers on their fears related to technology use by students; and, determine whether it comes from knowing less about technology then their students or making the shift to using technology as an educational tool. The use of technology for students ages 8- to 1- year- olds according to a Kaiser Family foundation (2010) study called *Generation M2 Media in the Lives of 8- to 18- Year-Olds*, Rideout, Foehr and Roberts state that,

> Computer ownership ranges from a low of 87% (among those whose parents have no more than a high school education) to a high of 97% (among those with a parent who graduated from college). (p. 23)

The study further describes that,

> A third (33%) of 8- to 18-year-olds report using a computer for school-related work in a typical day, compared to 64% who say they use a computer for recreational purposes. (p.23)

I focused on forming pedagogy for transforming the computer as a tool for learning. Through the interview, observation and survey process, I gained information on techniques that have worked for better technology use within the classroom. The results of these data analyses should establish a system for creating an urgency for change, based on increases in appropriate use. My previous study indicated a tremendous increase in student engagement during technology use as opposed to a teacher directed question and answer session.

Research Design

The type of data I gathered within my change plan are both qualitative and quantitative data. For qualitative data, I submitted an electronic survey which both teachers and a district administrator were invited to complete. I monitored a focus group of instructors on the eSTEAM team that included 6th and 7th graders, as they work through the change process of incorporating technology use within their classrooms. To gather quantitative data I looked at the score of the benchmark assessment test and monitored overall results. Due to the change in testing this year there was only one benchmark assessment so the monitoring for gains before the State test was limited to only one session. I compare the participating student groups with the non-participating student groups and analyzed the results.

I envisioned that the accuracy of my electronic survey data helped me discover some of the cultural feelings gathered through the implementation of technology immersion within the classroom. The information gathered from these surveys may help provide support needed to assist the change plan and provide vital information for successful implementation. In the "As Is" analysis found in Appendix A, I list the teacher's fears as being one of the main stumbling blocks for not using technology in the classroom. These fears include; the students' having more technology skills then the teacher, the teacher not getting the support and training needed for growing technology knowledge and skills, and the teacher not willing to be flexible with trying a new program or APP to test out which might provide the greatest tools for student success. This

might also include deleting programs that may have a huge comfort level for the teacher in order to try new programs that may provide greater support for student growth.

The urgency for developing technology used within the classroom is the fact that many of the student assessment tests are computer based. I have seen students struggle with the keyboard in not having the proper skills needed to test on a computer system. Another fact is how our world is changing through the use of computers. Wagner (2008) cites statistics from Rosen's book, Me, MySpace and I: Parenting the Net Generation, "87 percent of teens are online, increasing from 60 percent of 12-year-olds to 82 percent of 13-year-olds and 94 percent of 16- and 17-year-olds". These increases indicate the amount of time students are spending on devices. Educators must stop fighting the battle of short attention spans and time spent using the device as an entertainment tool to making the switch of providing ways to use the device as an educational tool. The need for these changes creates the urgency.

Participants

The participants in my study were eleven teachers who made a decision to use technology within their classroom more than 50% of the classroom period. Originally there were twelve teachers asked to participate, but one decided opt out. The eleven teachers were key participants and were chosen in order to assist my district with how to develop a culture of technology use within the core classroom. I also interviewed the secondary director to gain greater understanding of the district's position on using technology within the classroom.

Data Collection Techniques

Surveys

I used a survey monkey to gather qualitative data on how my teachers felt about using data within their classrooms. I surveyed (Appendix H) eleven classroom teachers, four science teachers, two history teachers, two technology teachers, two language arts teachers, one math teacher, one art teacher and a media specialist who also teaches television production. In my "As Is" found in Appendix A under the context category, I list a number of hypotheses on why teachers may not use technology within their classrooms. I analyzed each question and wrote a short synopsis of the survey results. I graphed the results of each question and listed them in a data table. The survey helped me gain insight on developing an in-depth understanding on why teachers hesitate to use technology. I used the information from my survey to help combat some of the hesitation to be able to provide support for creating a change culture.

Interviews

I interviewed eleven teachers (Appendix I) and a district administrator (Appendix J) on using technology within the classroom. These interviews helped my participants put a voice to their feelings and helped me to understand how to create a plan for overcoming obstacles. The teacher interview responses focused on their students and their classroom. The district administrator's responses focused on the impact of technology infusion at the district level and how this inclusion was a positive effect in moving technology forward at little district cost.

Observations

I observed all participating teachers for student engagement by comparing student participation while using technology versus student engagement when technology was not in use. A data table rubric (Table 29) was used for reporting the non-technology inclusion classes and I counted the number of students who raised hands to a single posed teacher question. These classroom observations assisted with an actual visit to see students' engagement in action. Due to time limitations, I completed 10 to 15 minute classroom walkthroughs in 15 regular classes, (these teachers also had technology enhanced classes), I listed these responses in Table 29.

The comparison data was gathered from teachers who had posted questions through a technology forum to Google Docs (a way of collaboration on-line). I gathered data from three teachers and posted the results in Table 30. Time limitations prohibited me from gathering more on-line data. In both the technology inclusion and non-inclusion classrooms I recorded the date, the number of students present, designated teacher, the teacher's questions and the number of students who responded to the question. All teacher participants signed an informed consent form to participate.

Data Analysis Techniques

Quantitative Data

I monitored the number of students who responded within class (Table 29) and who responded on line (table 30) and compared the data and recorded the results as engagement. I reviewed student academic growth using benchmark assessments and monitor the achievement scores of teachers who use technology over 50% of the class time. I posted the results of the benchmark assessment in Table 31. I also monitored the

results of the students who tested on the Certiport industry certification test and posted the results in Table 32.

Interview Data

I completed an interview of ten participating teachers and the district Secondary Director in order to gain greater understanding of the application of technology within the classroom setting. For a copy of the Interview Protocol Questions for the teacher participants, please see Appendix I. For a copy of the Interview Protocol Questions for the Secondary Director please see Appendix J.

I analyzed the responses of each interview question for emergent themes and graphed the results in data tables. The emergent themes gave greater credence to the responses in the quality of responses having a central voice. The central voice in these emergent themes seemed to unite the interviews and I believe gave a sense of stronger responses.

Ethical Considerations

I gained permission from all surveyed and participating teachers and administrators. I did not use names when reporting data to protect privacy and confidentiality. Participants were chosen by me based on willingness to participate in growing technology use within their classroom. I followed all District guidelines and all guidelines involving minor protection. I did not use any individual minor data and all data reporting minor assessment results are available to the general public and required no permission for the minors to participate. I only used numbers from the classroom, and I used no individual student data.

All participants received and signed informed consent forms. The school site administrator signed an informed consent form (Appendix K) to allow consent to conduct research at the school site. I also had each adult participant sign an informed consent to

gain permission for the adult participants to be surveyed (Appendix L) and I used no names in order to protect identities of participants. Each adult that I interviewed signed an informed consent form to gain permission to use the interview results; and I protected all participants' identities (Appendix M). I gathered informed consent forms for all classrooms to be observed and the data to be reported (Appendix N).

All participation was voluntary and a participant could discontinue participation at any time. I held all identities confidential and I did not attach the identities to any of the data. Only I had access to all of the surveys and field notes, which I kept in a locked file at my home. Participation in this study did not involve any physical or emotional risk beyond that of everyday life. Each participant may have gained some direct benefits from taking part in this research study. It is my hope that the goal of the study contributed to our better understanding of the implementation of Bring Your Own Device programs and the use of technology in the classroom. While the results of this study may be published or otherwise reported to scientific bodies, all identities of participants, the identity of the school, the identity of the general location, nor the identity of the district was revealed. All survey, interview and field notes will be kept in a locked drawer for five years according to National Louis University dissertation protocol. At the end of five years all participant data will be destroyed.

Conclusion

I gathered data to help develop a cultural change of teachers overcoming hesitation of technology use within their classrooms. As I gathered data, I was well aware that all data collection is subject to some measurement error" (Patton, p. 403). My objective was to gather sufficient data to have a low measurement error.

Understanding that "interpretation depended on understanding factor analysis" (Patton, p. 400). It was most important to scrutinize my results to make sure I can develop a plan that will be able to be used by my district to encourage increasing technology use within each classroom.

The goal of my change leadership plan was to grow technology use in my 6th and 7th grade classrooms by using the Bring Your Own Device (BYOD) program. I hope to further reach out to the feeder high school and other middle schools to begin developing the use of technology enhancements within the high school core classrooms. It was important to gather qualitative data to be able to overcome the obstacles and hesitations of teachers in using technology within their classroom. Comparing benchmark data will gain insight on increasing engagement within the classroom and should therefore show an increase in student benchmark scores. Gathering and reporting of the data is extremely important so results can be repeated and found worthy of trial within other schools.

SECTION FOUR: RELEVANT LITERATURE

Introduction

Wireless technology has changed the way we day to day communicate**.** There is rarely a school day in which I do not use my computer or cell phone for work purposes. Very few businesses perform today without the using some form of technology. According to a small business technology survey by David Ickert (2013), 84% of small businesses utilize laptop technology (para. 3). In order to prepare our students for the 21st Century work force I feel educators should embrace the use of technology within their classroom best practices. This would illicit a change of expectations to accept students and teachers using devices during the school day for learning and teaching. If we look at other stakeholders according to a 2013 Speak Up survey, "61% of parents said they would prefer their children were in a class where they could use their own device" (p. 3). If the community, students, teachers and parents are interested in using devices within the classroom setting, what is stopping us?

A technological device can be an amazing educational tool. The inclusion of technology into the classroom will create a need for changing the way we teach and learn. Wagner (2008) states, "The use of Internet and other digital technology has transformed both *what* young people learn today and *how* they learn" (p. 178). To create a culture of change it is important to make sure each stakeholder understands the need for the change. Wagner et al., (2006) writes about the envisioning phase of a whole system change, "These shareholders begin to focus on how they need to adapt their roles to enable their students to succeed in the twenty-first century" (p. 145).

Changing From Within

I believe the change must happen from within the system. Bryan Goodwin wrote an article on schools needing to work from the inside out. In his article Goodwin writes about the difficult shift of change, " when schools face thornier challenges in which the way ahead is less clear, they need to find a different approach - one that drives improvement not from the top down, but from the inside out" (2015, para. 12). Using technology within the classroom is going to require specifically buy-in by the teacher. The *Speak Up 2013* (2013) a national research project sent out over 403,000 online surveys representing over 9,005 schools nationwide. Figure 1 presents the results of the survey and breaks it down between parents, teachers and administrators.

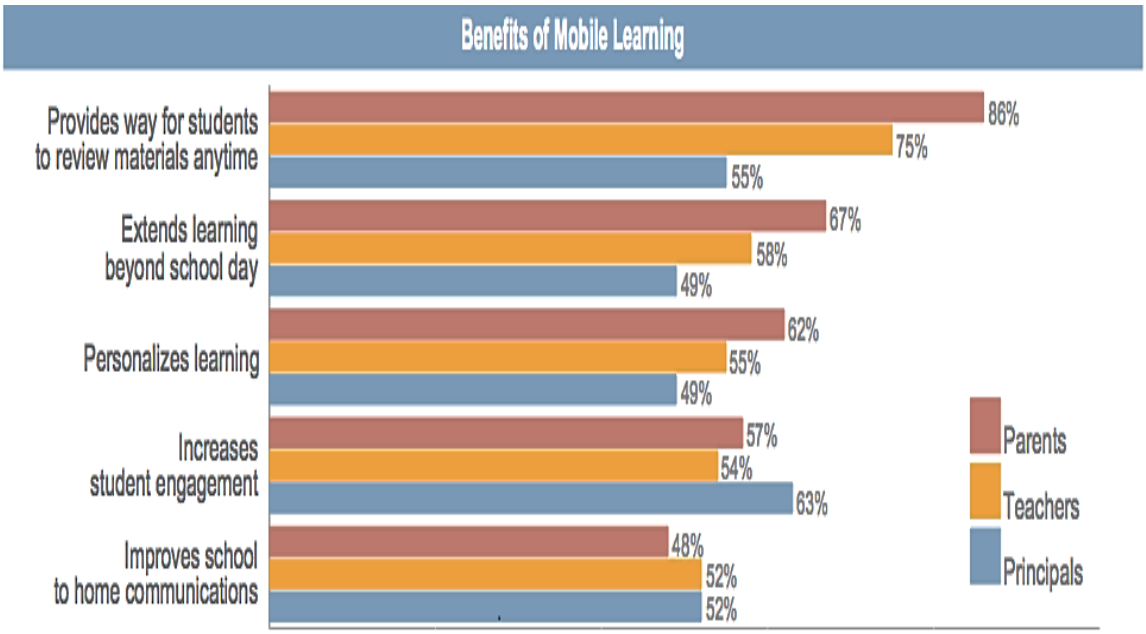


Figure 1. Benefits of mobile learning as represented by *Speak Up 2013* National Research Project: in the fall of 2013, over 403,000 online surveys from K-12 students, parents, and educators representing over 9,005 schools nationwide were collected by the project (Speak Up 2013).

Figure 1 data indicates the close relationship between how parents and teachers feel about using mobile learning. I found this graph to be of particular interest, for it represents what I have found from my survey results on how teachers felt about using technology within their classroom. Most teachers notice the engagement of the students and are interested in progressing with growing use within their classrooms for greater student participation.

In line with the *Speak Up 2013* findings, my classroom observations also indicate that teachers use devices for review of material that will be assessed and use devices for project learning and collaboration. In March of 2014 when we piloted our Bring Your Own Device (BYOD) program, we began with incorporating technology into the core classroom with only two eighth grade teachers. The second year we incorporated a "paperless classroom" into all grades and all core subjects and the program grew to fourteen teachers. In 2015-2016 school year the program will grow once again with the addition of more Language Arts teachers and the music teacher is interested in beginning a garage band implementation to learn about audio and sound and the uses in video and theater. I found with the addition of the twelve new teachers that I was unable to give the one-to-one support I had given during the first year. I became more of a facilitator as the teachers began to design their individual classrooms to meet their student's learning needs. As the administrator responsible for the project, I found the time in the school schedule for meetings, coordinated and facilitated the meetings, and tracked progress while also tracking roadblocks and potential roadblocks. I assisted in maintaining continuous communications with our district level leaders, staff members, and other stakeholders. In addition, we initiated student certification assessments using Certiport, which is an on-line Pearson test bank on industry certification. The Ceriport certification

assessments we implemented were for Adobe Photoshop CS6 and for Internet and Computing Core Certification (IC3). I was responsible for the time consuming tasks of loading the test banks onto devices, and then scheduling students to take the assessments. A link to Ceriport is included as a citation on my references section for informational purposes; I will subsequently explain certifications during the "Choosing Technology" portion in this section, "Section Four: Relevant Literature".

Teacher buy-in is a crucial foundation to program success. Without teacher buy-in of comprehensive technology integration into the curriculum, it would be impossible to expect a teacher to lose class time to certification testing and to technology integration into their classroom practice. They must have control of the pace and content of technology implementation; the classroom teacher must own the process of when and how to integrate technology into their lessons to enhance student learning and support student achievement of standards. The purpose and the effectiveness of technology integration are significantly diminished if a teacher adds technology just for the sake of using technology.

Providing information on how to implement technology into a classroom is not enough. Patton warns that if you think "information will produce knowledge change and knowledge change will produce behavior change . . . . this model doesn't work" (Patton, 2008, pgs. 347-348). Providing information alone does not affect the behavioral changes in the classroom that we are seeking. Patton further explains, "An evaluator can often have greater impact by helping program staff and decision makers empirically test their own hypotheses then telling them that such casual hypotheses are nonsense" (Patton, 2008, p. 348). Patton is advocating for an experiential method of engaging educators in

their own discovery of best practices as a means to affect significant understanding and behavioral change. I found this to be true, for rather than telling my teachers "how" to integrate technology, I challenged them to try different methods and classroom applications; both their failures and successes, as I observed, were incorporated as they designed increasingly more effective applications and established greater ownership of technology applications. Of the fourteen teachers I observed this year, no two teachers had the same process. Each developed their implementation when it best fit into their course content as a means to enhance student learning.

I anticipated that technology integration in the mathematics classroom would be the most challenging. Math content, characteristically prescribed, has so many standards to cover that the addition of one more standard seemed impossible, much less technology learning standards. Fortunately, my math instructor, a former administrator, has a keen interest in reinforcing student use of technology, so he agreed to integrate Excel spreadsheet software into his 6th grade math class. By integrating the use of the Excel software into the course classroom, his students were able to achieve an industry certification. Of the 55 students who took the IC3 Key Applications exam, 92% of his students passed the Excel portion of the IC3 Certification. His results are remarkable. The students enjoyed learning math by applying the content within the Excel program. I credit some of the success to Patton's advice: I did not tell this math teacher how to implement Excel into his math class; he simply agreed to taking on this portion of the technology standard and found his own way to integrate technology with content and instructional practice. His willingness to rise to the challenge, his content area expertise, and his ownership of the process were the ingredients of success.

Choosing Technology

As a school, we chose to implement BYOD for a great part due to lack of funds. We are a non-Title I school so do not benefit from Title I technology funding. With budget restraints, our school does not have funds for the purchase of technology. With a deficit in funds came hard financial decisions. District budget deficits resulted in a budget without allocation for technology. Our district determined that at this time technology was a "want" and not a "need". No technology was to be purchased using district funds for students or staff use. Our district did not have the money to implement nor had the capacity for seeking a 1-to-1 computer grant, a technology device distribution system that allows for districts to purchase and either give or loan a laptop to each student. However, even within this daunting fiscal context, we wanted to implement technology experiences for our students throughout their academic day. We were well aware of our student's constant use and facility with mobile and laptop devices. We understood the educational potential of these devices as academic advancement tools. Therefore, we needed to think outside of the box.

We began by familiarizing our teachers with the BYOD concept. We established a small committee of three people to write a contract of specifications and agreements for participation in BYOD for student and parent agreement and signature. We strove to make sure there was consensus among our teachers in order to support the buy-in of all of the "individual" stakeholders. Wagner, et al. (2006) make their main premise that, "leaders must understand and bring together the challenges of both organizational and individual change to successfully lead the improvement processes in schools and districts" (p. 193). Once our teachers had agreed to piloting a BYOD program at our

school, I went to the district to gain permission to try the pilot. We needed to gain the "organizational" support, so I focused on gaining our district's approval of implementing a policy and our need for a school "guest network" which would enable the students to use their devices under the protection of a secure district network. I sent the policy to the district for legal approval and I met and hosted district meetings, so there would be full understanding and buy-in on piloting the BYOD program at my school. Following the three-month pilot, with the new school year beginning, we changed the contract from an opt-in contract to an opt-out contract and added it to our student handbook as the BYOD policy (Appendix F). We wrote then created steps to be added to the student behavior plan for the possibility of student inappropriate technology usage and other potential infractions such as texting, video or picture taking without a person's permission and using the device without a staff member's permission. We met with the parents through hosting evening meetings and during the School Advisory Council (SAC) meetings and Parent Teacher Organization (PTO) meetings. We also sent out phone messages on the change of the implementation of a BYOD policy and provided our parents with as much information as possible so the change could be fully communicated. We met with students within our Science classrooms and reviewed what would be considered correct use of technology while on campus. We informed our students that with the privilege of allowing student use of technology during the school day came the responsibility for using the technology correctly as educational tools. Our established protocol was the direction that a teacher would inform the student when use was allowed.

Once we had the technology on campus, we chose to use what Oden (2012) refers to as a "blended model; it combines two modes of delivering instruction: online and face-

to-face" (p. 131). The blended model gave teachers the autonomy of choosing when to use technology within their classroom to make learning most engaging and effective. Hattie (2009) defined computer use as, "covering a large multitude of meaning implementations from mainframes, desktops, and hand-held devices to the internet" (p. 220). After completing his study on computer-assisted instruction he found that "25 times out of 100 when computer aided instruction is used, it will make a positive difference" (p. 220). This meta-analysis makes a difference in the outcome of student success. We do not demand a certain type or brand of technology. Some students choose to use notebooks, laptops, cell phones and various other devices. While dealing with issues of having a multitude of different devices within one classroom and a teacher's lack of familiarity of certain anomalies within specific device use, we developed a "survival" strategy for overcoming this challenge. We simply would ask our other students for assistance, each time we faced this challenge there was some student in the classroom that had the knowledge on how to make the device work. This peer collaboration empowers students with leadership tasks and gains ownership to learning progression. Hattie (2009) further strongly states, "The use of computers can assist in engagement and positive attitudes to learning outcomes" (p. 221). I observed that the choice to create a BYOD policy and to incorporate the technology into instruction does increase student engagement and with the increase in engagement, students' performance and learning outcomes do increase. Some teachers are still very hesitant to use technology and limited time and funding available for training and equipment often finds teachers putting aside implementing new technology approaches and sticking with the tried and true traditional teaching methods. Odden (2012) shares the effectiveness of learning on-line, "Technology has the potential

to increase student achievement when teachers use instructionally sound techniques that take advantage of effective pedagogy and are linked to a rigorous core curriculum program" (p. 133).

There are noted times when technology can get frustrating. I have found through observing classrooms that sometimes the lesson the teacher has in mind may not work due to disruptions in classroom application or in technology service. In a White Paper by JAMF Software (n. d.) they write, "Some of the biggest drains on instructional time include: beginning of class, moving from topic-to-topic, checking for understanding, and end of class" (para. 15). My observations support these lag times. When using technology in class the beginning of a class this is one of the most difficult times for progression. A teacher must have classroom protocols in place. These protocols would be to write, demonstrate (in small sections) and then seek out students who still cannot progress while others move forward with the assignment. The best teachers have silent signals such as solo cups of red, yellow, or green. All cups begin on green and students move the outside cup to a different color to signal the level in which the students is struggling. At a quick glance, a teacher can observe the pace of the class and of individual students. If some are being left behind, the teacher will slow down or repeat the lesson content or directions. If the majority of class is moving ahead, the teacher can address the individual or individuals who are moving at a slower pace. In addition, it is essential to use cooperative groups so that the teacher can let the class know to help their group partner with getting to the correct command before everyone moves along. Some teachers have students lead the steps for each group with instructions posted in a group notebook or taped to the desk. It is important for the teacher to have two to three spare computers between every 25

students (about one spare for every ten students). This will help if a student's computer dies; they forgot it at home, or other such situations that prevent them from using technology for the specific assignment.

Moving from topic to topic can be tough as well. I found that if a teacher asks the student to lower their screen to a 45-degree angle and gets every ones attention, while giving direct instruction, usually this process goes a bit smoother. Of course, the student using the best practice of repeating the silent signal for help is equally important. In checking for understanding, some of my instructors use a free APP called "Poll Everywhere". I have included the website in the reference section. Poll Everywhere (n.d.); "Asks your audience a question. Audience answers in real time using mobile phone, twitter or a web browser. Responses populate live on the web or in a Power Point" (This is how it works). Another favorite for reviewing is a free APP called Kahoot! (n.d.) which is a "connected learning" application, can be completed in any language, and is a review game, which the teacher can write in questions to hone standard skills. I have placed the Kahoot web site address within the reference section. There are many other free educational tools that can help teachers check for understanding and it is a great way to have some of the class review while other members get needed individual instruction.

The end of class is tough as well, and at times seems chaotic for all of the technology tools have to be put away and the room put back into order for the next arriving class. We require students that bring their devices to school to have a thick travel case. This helps devices survive ridding in a backpack from class to class. However, sometimes the bell rings while classroom activities are still underway. It is again

important to have classroom procedures in place so students know they are responsible for technology care. Some teachers use a free timer APP and there is not one to recommend over another for there are many. They post the timer on their Electric Light Machine Organization (ELMO) and can even set an alarm on the timer to give a five-minute warning for cleanup and exit slip purposes. All of these classroom strategies can be taught by giving teacher training time and giving time for teachers to collaborate. I have taught a class while an instructor went in and supported or visited another teacher. I have modeled strategies for teachers to use in class to assist with classroom management and establishing protocols for success. It is important to give teachers the time to sort out challenges together and apply different strategies for using technology so the progress is not lost in the process. "Resonant leaders are stepping up, charting paths through unfamiliar territory, and inspiring people in their organizations, institutions and communities. They are finding new opportunities within today's challenges, creating hope in the face of fear and despair" (Boyatzis & McKee, 2005, p. 2).

Sometimes interruptions involve the lack of infrastructure needed to run, at an adequate speed, all users technological devices. Whether a school is using a 1-to-1 student computer access system or a BYOD there is still the infrastructure needed to operate an effective technological system with multiple student and staff users. This is an important factor that must be problem solved before a device user system is put into place. We installed a wireless guest network for our students to be able to gain network and internet services. According to Fran (1989), "A local area network or LAN is a data communications network that covers a limited geographical area" (para. 9). Our wireless guest network is the only network our students are allowed to use. This guest network is

protected by our school district's computer security system. The system prevents infiltration of viruses and occurrences of improper student research. While nothing is 100%, the protections we have in place have not had any negative results in two years of use. Along with a guest network, we installed routers and hubs to boost our network signal and speed up our network capabilities. This helps each staff member and student have adequate technological wireless use.

Odden (2012) lists the budgeting needs as, "approximately $250.00 per student to maintain an updated technology base" (p. 123). I am not certain what Odden includes in this budget amount but, there is an expense to creating an operating system; this cost would differ depending on the work that can be done by district employees and resources or whether it has to be outsourced. . My school is 130,000 square feet and the cost of placing in a guest network was around $23, 237.00. The network serves 1100 students. While I have simplistically described our system, it is important for a school district to understand that it is not simply purchasing the computers, it is also important to be able to use the computers wirelessly to enable ultimate, efficient classroom use. Mitchell (n.d.) lists the potential benefits of using networks as; "faster access to more information, improved communication and collaboration, and more convenient access to software tools" (para. 2). Having a protected guest network also relieves the worry that devices may be misused, may encounter unwanted viruses, or unwanted outside users. Parents are very pleased that we use a guest network and have implemented regulations that students must use the guest network while they are on campus. Every staff member monitors student guest network use.

Industry Certification

"The Florida Career and Professional Education Act (CAPE) was created to provide a statewide planning partnership between business and education communities, to expand and retain high-value industry, and sustain a vibrant state economy" Florida Department of Education (2015). The CAPE ACT entitles that for every student that passes an industry certification school grade points will be gained and go toward enhancing the school grade. Dollars will also be returned to the school for every test the students' pass. This money can help fund the needed software and hardware to be able to upgrade and provide the most updated equipment possible. Senate Bill 850 (2014) states, "The Legislature intends that by July 1, 2018, on an annual basis, at least 75 percent of public middle grades students earn at least one CAPE Digital Tool certificate a Florida Digital Tools Certificate" (pp. 12-13). This mandate ties in the State's fervor for industry certification within digital tools to be implemented in the middle school curriculum. I have attached excerpts from the Senate Bill within this document and provided a link for full access. In my opinion, the State of Florida Department of Education is being progressive in trying to make technology a priority. The link to the list of 2015 industry certification exams is attached in the reference portion of this paper. The industry certification list changes often, mainly due to the addition of middle school certification within the secondary education list. I am assuming, in the near future, an elementary industry certification will soon follow, with basic computer skills being added as an elementary certification component.

Fowler (2009) shares, "The effective combination of several instruments depends on coherence; all instruments must be used to achieve the same broad policy goal. Failure

to keep the principle in mind leads to a confusing set of policies that undercut each other" (p. 258). We felt aligning the core curriculum up with industry certification standards would be a way of providing our students with 21st century technology skills that would align with work force demands. We chose to focus in on the Adobe Suite that includes Photoshop, InDesign, Illustrator, Dreamweaver, Premiere Pro, After Effects and Flash. We worked on Photoshop for 7th and 8th graders and will include other releases as students and teachers become more familiar with the applications. Sixth graders focus on Internet Computing Core Certification (IC3) that includes Key Applications, Computing Fundamental and Living Online. During our pilot year of implementation, we focused on Key Applications tests skills in word processing, spreadsheets and presentation software. We felt this application covered the basics that most students would need for everyday use including skills needed to enhance State tests and assessments that are now mainly given via an on-line test. Class use and presentation skills would be enhanced as well and later skills for work force needs.

We aligned the core curriculum projects and classroom collaboration pieces to the standards for the specific Certiport certifications. An example for 6th grade might be to offer students the opportunity to present a Power Point presentation or create a Prezi – which is a virtual canvas similar to an on-line interactive poster. Students would practice their industry certification presentation standards while creating a project to enhance a core curriculum standard. In the more advanced grades, an example might be that students would create menus in science class using Photoshop skills and present the menu, logo and other photo shop applications meeting the science standards of calorie and food choices. Students learn the importance of health and diet and the importance of

marketing and presenting a healthy product. This alignment established a direction and coherence of standards so that everyone has the same set of standards to follow but can be creative in how they implement these standards. Students learn how to use applicable work force skills in their daily course work. The alignment of these two factors helps to organize which technological skills to teach. Since there is a funding source attached, the application of combining industry certification standards with curriculum standards will help prepare our students for the 21st century work force; it is a win-win. "….curriculum reform should be driven by what is most important for today's students to learn in order to survive in a rapidly changing society" (Stern & Kysilka, 2008, p. 113).

Providing for sound curricular development to prepare our students for their futures is the reason for standard based instruction. The direction is sound when one combines an engaging – current resource with core curriculum standard learning. We still struggle with finding the time to have teachers collaborate and share their discoveries as often as we would like, but the implementation of technological within our core curriculum classrooms has created an exciting learning experience for both teacher and student. This all came about because of implementing a BYOD program and overcoming the hurdle of accessing current technology with limited funds.

Definition of Terms

The following terms are fundamental to the conversation as consensus building, planning, development of capacity, and implementation took place at my school. These terms are listed here with a brief definition as a point of clarification for my usage of the terms in this Leadership Change Proposal:

APP: Is a short version of the word application. An application is a program that allows computers, iPhone and other electronic devices to perform a given enhancements or operations.

CAPE: Is an acronym for Career and Professional Education that is a State of Florida act, which was created for approved planning partnership between business and education communities, to expand and retain high-value industry, and sustain a vibrant state economy.

download: Transferring information from the internet to a computer.

eSTEAM: Is an acronym for an academy program that incorporates technology in the outputs of students' projects enhancing industry certification within a curriculum class. The letters stand for excellence in Science, Technology, Engineering, Arts and Math.

ELMO: Electronic Light Machine Organization. It is a projector device that projects computer or overhead projections up for audience viewing.

Exit Slip: A tool teachers use to have their students reflect on the days class, ask questions, or close with a response to a prompt.

Glogster: A cloud based platform that allows different media to be presented on a virtual canvas.

Kahoot!: A free interactive website that helps students learn and review in a technology game.

On-Line Jeopardy: A free interactive website game that makes reviewing fun by creating an on-line game for core-standard reviewing.

Penzu: An online journal.

Poll Everywhere: A free App that electronically polls students using a technology source to check for understanding. The answers are real time projected and can be viewed by the class and reviewed by the presenter.

Quizlett: A free APP used to help students review vocabulary.

URL: Uniform Resource Locator is the fundamental network identification for any resource connected to the web.

Conclusion

The most important factor to bringing about adding a Bring Your Own Device (BYOD) program and implementing the technology into the classroom to grow student learning is creating a culture for a successful change. Wagner, et al. (2006) describe culture as, "the shared values, beliefs, assumptions, expectations, and behaviors related to students and learning, teachers and teaching, instructional leadership, and the quality of relationships within and beyond the school" (p. 102). A relevant reason for change within a school, should not only benefit the students' mastery of curriculum standards, but also be applicable to what they need to know or apply to future career opportunities. It gives the student a reason for learning the given material and makes the learning applicable. With the inclusion of technology, you will observe students applying more time and meaning to their classwork and projects. The skills they learn will move them into the 21st century and give them the tools for success both in school and into pursuing their future dreams. Educators are facing new challenges that begin with great expense and often end - too soon - due to little funding. Heifetz, Glashow and Linsky, (2009) describe this adaptive change as, "New environments and new dreams demand new strategies and abilities, as well as the leadership to mobilize them" (p. 14). Developing a BYOD plan

will bring current technology to schools at little cost to the district. Taking this tool and then applying the application of using technology in the classroom will better prepare our students for using devices as they learn, develop and discover new ideas.

SECTION FIVE: DATA ANAYLYSIS & INTERPRETATIONS

The purpose for my study was to study the effects of establishing a Bring Your Own Device (BYOD) plan and the affects adding technology to core curriculum classes would have on the teachers and general student learning. I gathered both qualitative and quantitative data via surveying and interviewing twelve teachers on how they felt about using BYOD and what they thought about the challenges of implementing technology within their classrooms.

Findings

My research project gathered both qualitative and quantitative data in order to provide support for implementing a BYOD program and the additional inclusion of technology industry certification (IC) standards in a common core classroom. The purpose of my change leadership plan was to implement what Patton (2008) calls an instrumental use which, "refers to evaluation findings directly informing a decision or contributing to solving a problem; the findings are linked to some subsequent action and in that sense becomes an instrument of action" (p. 102). The findings I believe this program will support are the increase of student engagement and therefore improvement of student learning. The action of my findings will encourage other schools to begin a BYOD program to bring more technology for student's to use in their classroom. This decision will be a cost savings to our financially struggling district that has been unable to provide adequate technology to accompany the growing need.

My findings as well will fill a conceptual use by influencing my district leadership team to think about supporting the implementation of a BYOD program policy. Patton (2008) describes this best, "Conceptual use occurs when an evaluation

influences how key people think about a program of policy; they understand it better in some significant way, but no action or decision flows from the findings" (p. 103). While the district is not driven to making a final decision, my hope is this study will influence our district to spend funding on supporting the infrastructure needed as technology use grows. Without the infrastructure no matter how many computers one might get through purchases, grants and gifts, the technology would not run efficiently and therefore would be left useless. The program policy would give schools the ability to move to an instrumental use by allowing a BYOD policy on campus.

I gathered both qualitative and quantitative evidence through a teacher survey and teacher and district leadership interview. I completed a quantitative study through observing classrooms measuring student engagement and by comparing student data. My student data became limited as my State struggled with implementing a new State test and therefore limited me on the comparison scores between students who were in a regular class with the eSTEAM Academy class, which was a paperless classroom with a full blended model of face-to-face instructor with technology inclusion. Being a baseline year for the State test there is not any data to compare any growth. The State test scores will not be released until after September and therefore class-to-class comparisons will not be included. I have one benchmark score to compare and contrast the data between a regular and gifted Language Arts class scores compared to a regular and gifted eSTEAM Academy class scores.

My key questions for focusing on this change leadership plan helped me to develop my "As Is" model (Appendix A) and my "To Be" model (Appendix B). These models helped me to keep thinking in a systematic manner using 4 C's, "competency,

conditions, cultures and context" formulized by Wagner, et al. (2006, p. 98). I used my findings to answer the following research questions:

1. What effect might the institution and use of a BYOD – technology immersed program for the selected students have on their achievement grades, compared to other students who are not involved in a technology immersed classroom, and therefore do not use technology in their classrooms to the same extent as measured by the results of the Benchmark Assessment and State Achievement Test.

2. What do the participants (teachers) who are involved in a BYOD – technology immersed program at one middle school report as working well in the program?

3. What do the participants (teachers) who are involved in a BYOD – technology immersed program at one middle school report as not working well in the program?

4. What suggestions do the participants (teachers) who are involved in a BYOD– technology immersed program at one middle school report as suggestions for improving the BYOD– technology immersed program?

As a school-site administrator, I am also interested in other practitioner issues and questions related to the implementation of this new program at our school, such as:

5. What implications for district-wide application of a BYOD– technology immersed program are revealed in the study of this BYOD– technology immersed program at one middle school?

6. How will students who cannot afford technology, compete academically with students who can?

7. Is there a cost savings for the school (and eventually for the District) in using BYOD?

8. How many participating academy students will successfully pass the Industrial Certification Test?

Survey

I surveyed (Appendix F) fourteen teachers and received ten responses, which was a 71% response rate. I first gathered the teachers' demographics within the first five questions to see if there were any patterns that might emerge. My first demographic request was on the number of years the teachers had taught, which in total was an average of 9.4 years. Two of my teachers had taught for less than 3 years, three of my teachers taught 7-10 years, four of my teachers had taught between 12-17 years, and one teacher chose not to answer this question. The two extremes within my study were a first year teacher and a veteran teacher who was retiring after 32 years. I also surveyed the media specialist who taught a broadcast communications course and technology specialist on campus for greater understanding of possible challenges. My second demographic request was on the race of the teachers I had surveyed and 100% of the respondents were white. The third demographic request was the sex of the teacher: there were 80% females and 20% males. The fourth demographic request was regarding what subject the teacher was teaching; out of nine responses the predominate subject was science at 33%. There were two language arts teachers (22%). The remaining instructors who responded to the survey were one Civics teacher, one Graphic Design teacher, one Broadcast Communications teacher and one and Math teacher, each representing 11% respectively of the total respondents. One respondent did not answer this request.

Questions six through nineteen were open-ended questions so that I could gather qualitative information on what teachers were concerned about and on what worked within their classrooms. Administration and the technology committee used this information to better plan for teacher professional development and to make technology purchases for greater teacher and student support. Questions twenty through twenty-three used a Likert scale to gather information on percentages of usage and whether the students responded with: Always, Frequently, Sometimes, or Never. In addition, I included a comment box in case the teacher felt he or she needed to substantiate or explain their answer with a comment. I have desegregated and charted the data results for questions six through twenty-three to present the responses.

The first qualitative question, question number six, concerns the teacher's perceptions of the greatest challenges they face in using technology within the classroom and the reasons they had for identifying these challenges. There were ten responses to this survey question. Five (50%) out of the ten teachers listed students being off task and accessing inappropriate information as their major concern. Two teachers (20%) were concerned about students' digital citizenship, such as students placing personal information, videos or pictures on the cloud and the potential problem of students using a device as a means for cheating. In addition, these same two teachers mentioned the challenge of enforcing student compliance with all of the BYOD school policy rules (Appendix F).

Two teachers (20%) were concerned about students who could not afford devices (or students' whose devices broke or became disabled) or who shared devices that might be reallocated for use for testing so made unavailable for classroom use. The major

challenge identified was what teachers refer to as the “haves” and the “have not's”; students “with” or “without” computers being able to keep up with the students who had operable devices. Ten percent of the teachers responding were concerned about student cheating. One teacher’s greatest concern was concerning the availability of time for teachers to share, collaborate and discover technology uses for the classroom. The responses from survey question 6 are presented in Table 1.

Table 1.

Survey Question 6: What is your greatest concern about using technology in your classroom and why?

Greatest Concerns Responses	Response %	Participant Code
1. Student off-task or engaged in inappropriate use	50%	B, D, G, H, J
2. Digital Citizenship concerns (such as, students sending personal information, videos or pictures out to the cloud; student using a device to cheat; lack of compliance to the BYOD school policy rules)	20%	A, I
3. Unavailable technology due to lack of funding or technology being allocated for testing	20%	C, E
4. Ensuring protection for the school (student compliance and school liability for security breaches (such as unwanted infiltration of our student’s devices by hackers or phishing scams; school network security lapse; and loss or stolen devices)	10%	F
5. Time concerns (teachers not have the time needed to share, collaborate and discover technology uses)	10%	A (a two part response)

Note. Question 6. response rate: of the 14 participants were polled, 10 responded.

Question seven makes an inquiry into what teachers thought would be needed to help develop using technology within their classroom. There were ten responses to this question. The majority of the teachers responded with the need for training at 70%. The teachers also felt there was a need for collaboration opportunities at 30% and the need to have access to more technology at 20%. Single teacher’s responses (10%) included Administrators understanding of technology and the real uses. This response reflected on the evaluation system with some administrators evaluating technology use as using an

ELMO (electronic overhead) as sufficient technology use. The other two single teachers shared important needs of having available technology that worked and having a common language for greater student understanding and deciding on a common platform (Edmodo, Google Docs or One Drive). The need for adequate time for training and collaboration was most noted by responders, and I brought this information to my administrative team as a reason to improve the planning for staff development opportunities in the upcoming year. Other responses mentioned the need for the availability of more types of technology, administrators' knowledge of technology integration practices and the technology, provision of working technology for teachers, and the establishment of a common language, and a common platform.

The responses to this survey question provided insights and answers to one of my main research questions (Question 4. Appendix H) posed in order to gather best practices for a technology immersed BYOD program: What suggestions do the participants (teachers) who are involved in a BYOD–technology immersed program at one middle school report as suggestions for improving the BYOD – technology immersed program? The content of the teachers' responses reminded me of teachers' awareness of the need for not only the technology, but also for a variety of technology, common platforms, and working (current and well-maintained) technology. Furthermore, the responses underscore teacher awareness of their need for a supportive culture in which administrators and teachers understand technology and speak a common language.

Table 2

Survey Question 7: What do you think is needed to help you develop as a teacher using technology in the classroom?

Needs for Developing as a Teacher Using Technology Responses	Response %	Participant Code
1. Training for teachers	70%	A, B, D, E, G, H, J
2. Collaboration	30%	A, B, D,
3. Access to more technology	20%	C, D
4. Administrators understanding technology	10%	E
5. Working technology for teachers (meaning making sure devices were able to use the network and were in working order)	10%	F
6. Common language and common platform	10%	I

Note. Question 7. response rate: of the 14 participants who were polled, 10 responded.

I posed the eighth question to gather information on the type of use the teachers observed students using for educational purposes. Eighty percent of the surveyed teachers felt that students used technology for research more than any other use. Forty percent (some of these teachers listed multiple answers) felt that students used technology most during project-based assignments. Three teachers (30%) noted that students used their computers for content reviews: often teachers pose questions in a game-learning review sessions. Examples include Kahoot, On-line Jeopardy, and Quizlett as a few of the free interactive websites or APPS that are most used. Twenty percent of the survey respondents answered "teacher posts" which is the teacher posting a project, assignment, question or other academic learning tool onto the cloud and students respond to the teacher post. One teacher (10%) responded about collaboration as a type of student use. Students collaborate within the cloud that the teacher has created in order to work on assigned projects. The last single response (10%) was a reflective remark on all of the mandated testing that was required for this year, with the remark that none of which was useable as a diagnostic for remedial purposes. Since the state changed the student

assessment tests to reflect new standards after the school year started, our district's curriculum departments did not have the opportunity prepare and plan for the entire year. This resulted in curriculum guides and materials distribution to schools in 9-week sections. The answers to this survey question helped me to know what type of software might be needed to support students and teachers, and what types of recommendations to make to other teachers for class projects and the implementation of technology. This response gave me insight to work on my "To Be" (Appendix B) Context and Culture sections providing me with a better understanding of what technology students like to use. Further, it provided me with information for developing teacher training in student project based learning technology integration and opportunities.

Table 3

Survey Question 8: What type of use do you observe students using technology most for educational purposes?

Type of Student Use Responses	Response %	Participant Code
1. Research	80%	A, B, C, E, F, G, I, J
2. Projects - Assignments	40%	C, D, I, J
3. Review	30%	D, F, I
4. Power Point	20%	A, E
5. Teacher Posting (the teacher posts a project, assignment, question or other academic learning tool onto the cloud and students respond and collaborate to the teacher post)	20%	B, D
6. Collaboration (between students assigned to groups)	10%	D
7. Testing	10%	H

Note. Question 8. response rate: of the 14 participants who were polled, 10 responded.

Question 9 is concerning student misuse of technology. I gathered this information to assess the teachers' perception of how students most misuse technology while on campus. We have a BYOD policy and we have penalties for misuse. From the data that was gathered, I noticed gaming was one of the top misuses at 50%. Teachers

had asked that non-educational gaming not be allowed while students are on campus including common areas. Our principal felt that before school and during lunch, while students were being supervised they should be allowed to use appropriate home games (neither curse words nor extreme violence is permitted within games). Therefore, there will be games allowed during lunch and before school. The teachers felt it was very difficult to get students back on task in the classroom if this were even allowed in the common areas during administrative supervision times. We needed to bring this concern to the leadership committee in the future, for further consideration for the data indicates this is a major concern.

The other concern was with students using social media during school for 50% of the teachers felt this was an issue. If a student is caught using social media without permission, the device is to be confiscated and the parents must retrieve the device after school. All staff is to follow this protocol for consistencies in the discipline matrix. Thirty percent of the teachers wrote about "off task" use, which is defined as students not following the procedures but doing what they "want" to do rather than following the assignment. The teacher needs to manage this within their classroom as they would if a student were reading a magazine instead of the assigned text. This is a classroom management piece that will need to be addressed on an individual basis due to the many situations "off task" may cover. Single responses (10%) concerned students cheating as a misuse of technology by looking up information on a technology device during a test or claiming someone else's work as their own – plagiarism. The other single response included downloads in which students transfer information from the internet to their

device, during school, non-education downloads often are games to share or play with their friends.

Table 4

Survey Question 9: What is the greatest student misuse of technology?

Student Misuse Responses	Response %	Participant Code
1. Gaming (non-educational)	50%	A, D, E, G, J
2. Social Media	50%	B, D, E, F, G
3. Off Task Use (student finds interesting non-content information)	30%	B, C, I
4. Pictures or Video Streaming	30%	B, D, F
5. Cheating (Students using devices to look up information during a test or copying other printed work as their own-plagiarism).	10%	H
6. Processes such as downloading non-educational games from the internet.	10%	I

Note. Question 9. response rate: of the 14 participants who were polled, 10 responded.

The tenth question was about classroom management issues teachers might be having while using technology. I gathered this information to try to understand whether teachers felt the systems that were currently in place needed to be enhanced and if so, how? The largest response (40%) was on establishing clear expectations and making sure the penalties were reviewed and enforced. 30% of our teachers felt strongly about monitoring student use and several teachers responded that the students are very quick at switching screens when the teacher walks up to their computer. We problem solved this issue and if the teacher suspected that the student was off task, the teacher would look at the students history (URL) and see if the sites the student had been on were appropriate. The remaining data was single answers, which included using student silent signals for the need of support, teachers using Google Docs or One Drive to manage collaborations

and out of the class communications, and to make sure school filters protected students and student devices.

Table 5

Survey Question 10: What classroom management skills do you think need to be implemented to monitor technology use in your classroom?

Classroom Management Responses	Response %	Participant Code
1. Clear expectations with clear penalties reviewed and enforced.	40%	D, E, F, H
2. Vigilance and monitoring by teacher.	30%	B, C, J
3. Attention Signals for classroom management used by teacher as an attention-seeking device (Examples: Clapping, raising hand, whistling, snapping, music, light flickering are all used).	10%	I
4. Teacher learning Google or One Drive	10%	A
5. School filters to prohibit inappropriate information.	10%	G

Note. Question 10. response rate: of the 14 participants who were polled, 10 responded.

Question number eleven inquired into what types of training the teachers might want to receive in order to assist them in their current use. Many teachers responded with specific programs or APPS (66%). Two teachers (22%) felt opportunities for collaboration was important. Two other teachers felt that they wanted to incorporate within technology, reading and writing assignments. The information gathered from this question helps me with planning professional development for my teachers and providing them with the focused support needed to move forward. Respondent D was not a teacher but was a technology specialist who assisted teachers in the classroom with technology issues and respondent E was a media specialist. Some of the questions I asked specifically were driven toward a classroom teacher. You will see that sometimes

respondent D and E sometimes skipped a question, neither of these two respondents are fulltime teachers.

Table 6

Survey Question 11: In order to develop your skills in use of technology within your classroom, what type(s) of trainings do you believe may be of greatest assistance with your current application use?

Training Needs Responses	Response %	Participant Code
1. Google Docs or One Drive	33%	F, I, J
2. Adobe / IC3 (This is an industrial certification in technology literacy-Internet and Computing Core).	33%	A, E, G
3. Collaboration with other teachers?	22%	B, H
4. Writing (PEG-Project Essay Grade- A web-based writing practice program), and Reading Data	22%	A, C
5. No Answer – Skipped	11%	D

Note. Question 11. response rate: of the 14 participants who were polled, 10 responded.

The twelfth question helped me understand where the teacher might be getting frustrated. I asked for suggestions to improve technology use within the teacher's classroom. The main response (50%) to this question can assist our school and district to understand the need for student devices in the classroom; one-half of the surveyed teacher felt having some devices (4-6) would improve technology use. These devices need to be able to use the internet, but have minimal skills so students could continue to participate in class if they did not have a device. Thirty percent of the teachers felt training was needed to better support teachers in the systems and programs, which were new. Two teachers (20%) felt that they needed to be given more time to explore and share information on new APPS and assess current applications. One teacher wanted to learn about specific applications including Glogster - which is a cloud based presentation format and allows the student to use different kinds of media for presentations, and Penzu

– which is an on-line journal. Another teacher answered student training for the teacher must start from the beginnings of word processing including basic typing skills. These improvement suggestions will help our team to better prepare for future implementation. We are currently scheduled to receive 300 technology devices but we have not been given the parameters of what type of devices nor purpose. We will not receive these devices until just before second quarter.

Table 7

Survey Question 12: What would you suggest to help improve technology use in your classroom?

Suggestions to Improve Technology Use Responses	Response %	Participant Code
1. More school owned devices in the classroom for student use.	50%	C, D, E, H, J
2. Teacher Training	30%	G, H, I
3. Time for collaboration and to share with other teachers	20%	B, D
4. Web based (Glogster-poster design program, Penzu-journal program) applications. The teacher wanted to know more about these uses.	10%	A
5. Student basic training on typing and word processing skills.	10%	I

Note. Question 12. response rate: of the 14 participants who were polled, 9 responded.

Question 13 was given in order to understand the expectations of the teacher regarding enhancing technology within their classroom. Overwhelmingly the teachers hoped to experience an increase in "quality projects". Teachers have a passion for projects that "make a difference", projects that go above and beyond the assignment and encourage deep thought and effort by the student. At a 70% response, this number reflects the drive that teachers have for higher order projects. Thirty percent of the surveyed teachers hoped to use cloud based for collaboration purposes and school communication enhancements. One teacher answered that he hoped the quality of the

projects would enhanced in the BYOD classes as compared to his traditional class. One teacher hoped to see student engagement increase as compared to her traditional class. These responses give me insight on what to monitor to see if the teacher's expectations are being met.

Table 8

Survey Question 13: What do you hope to see your student(s) do more of in the BYOD technology enhanced class?

Teacher Student Technology Use Expectations in the BYOD Class Responses	Response %	Participant Code
1. Project enhancement. Quality projects with real world applications. Projects that can make a difference.	70%	A, B, C, D, F, H, I,
2. Cloud use (Google, One Drive, Edmodo)	30%	B, E, J
3. Quality use of programs (how the programs work and do what they are supposed to do and how well students like to use them).	10%	J
4. Classroom Engagement	10%	I

Note. Question 13. response rate: of the 14 participants who were polled, 9 responded.

Question 14 on what teachers expected to see less of reflects on the teacher's feelings about keeping rules and the safe application of students using technology. Throughout this survey, teachers repeat their concern on students misusing technology in inappropriate ways 50% of the teachers felt eSTEAM students should more often follow the BYOD rules due to more use and greater reminders by teachers. Twenty five percent of the teachers thought there would be less off task usage such as students watching inappropriate videos and posting pictures while others list gaming, texting, or other social media use misconduct. Teachers felt eSTEAM students would use it more for the intended use. We refer to the proper use of technology as "digital citizenship" and we are diligent in fine-tuning the processes, such as the discipline matrix and student

informational meetings, to better our current system. Two teachers thought there would be less paper and pencil usage and were striving to have "paperless" classrooms in which very little paper was used. Teachers felt the eSTEAM students would be more creative and not just use the copy / paste option for responding to questions. Two respondents skipped this question for they do not have classes.

Table 9

Survey Question 14: What would you expect your student(s) to do less of in a BYOD enhanced class?

What Teacher Expects Students to do less of in a BYOD Class Responses	Response %	Participant Code
1. Inappropriate use and breaking the rules of BYOD	50%	C, F, G, I
2. Being off task and not using devices for educational purposes but watching YouTube or other non-educational videos or playing games.	25%	E, H
3. Paper and Pencil use	25%	B, E
4. Less copy and paste. Less compliance (more creativity)	13%	A
5. Skipped Question	25%	D, J

Note. Question 14. response rate: of the 14 participants who were polled, 8 responded.

In asking teachers about their greatest concern in using technology in question fifteen, I hypothesized that teachers might reflect on their concern for proper use. What was interesting in the response was the teachers focus on the student's ability to have basic skills and to be able to not be "consumed" with strictly using technology. We are using a blended model (Odden 2012, p. 130) in which our teachers use both face-to-face instruction and technology deliveries to strengthen the students learning experience. As Odden discussed: "Instruction that combined online and face-to-face instruction had relatively larger positive impacts on student learning that either face-to-face instruction or only online instruction" (Odden 2012, p.133). In gathering teachers' concerns, it will help

prepare us for continuing to reinforce and overcome perceived challenges through proper training or the students and teacher professional development. Forty three percent (43%) of the teachers felt students lacked basic skills; 29% of the teachers thought that the teacher's lack of experienced and expertise was their biggest concern. Another 29% thought students might misuse the devices by taking videos or pictures without permission. Three teachers, 38%, skipped this question for they did not have specific concerns.

Table 10

Survey Question 15: What is your greatest concern about using technology in your classroom?

Teacher Greatest Concern Responses	Response %	Participant Code
1. Student lack of basic skills and interactions. Students being consumed by virtual world.	43%	C, D, J
2. Teacher lack of experience and expertise	29%	B, H
3. Students' inappropriate use. Taking pictures or video without permission.	29%	G, I
4. Skipped or None	38%	A, E, F

Note. Question 15. response rate: of the 14 participants who were polled, 7 responded.

Question 16 was on the greatest experience the teacher had with implementing technology into their classroom model. This helps teachers focus on the positive attributes of technology inclusion. I was interested in what perhaps even surprised the teacher once they added technology to enhance their classroom curriculum. While 40% of the teachers were excited about the student collaboration within the cloud, many of the other responses were very individual. These individual responses led me to question my teachers on their understanding of technology collaboration within the cloud (Google Docs or One Drive) and to focus on some trainings on this use. Two of the teachers, both of whom were science teachers, felt that being able to demonstrate often difficult to

communicate abstract concepts using technology provided a wonderful experience and learning tool for students. Other single answers included; classroom management applications, current research information, enhanced student projects- the teacher shared that they "came to life", and one respondent who was not a teacher skipped this question.

Table 11

Survey Question 16: What was your greatest experience with using or seeing technology use within your classroom or while at school?

Teacher's Greatest Experience Responses	Response %	Participant Code
1. Student Collaboration in the cloud and student engagement.	40%	A, E, F, I
2. Being able to deliver abstract concepts	20%	C, J
3. Classroom management application	10%	B
4. Research and current informational use	10%	G
5. "Projects came to life. It was amazing!"	10%	H
6. Skipped	10%	D

Note. Question 16. response rate: of the 14 participants who were polled, 10 responded.

Question 17 focused on the teacher's favorite technological application. This question did help me to understand what the teachers currently use most and what they are comfortable using. Some of our sixth graders use Edmodo (which is a website that is controlled by the teacher for student collaboration purposes) in elementary school, and we found it was best to begin with Edmodo, for it was familiar to most of the sixth grade students. With using BYOD, we found it was extremely important to focus on the "digital citizenship" and responsibility of using and bringing technology on campus. Parents are not informed of social media and we have taken on certain challenges to try to keep our students safe under the new technology outreach capabilities. We therefore decided to shift students to Google Docs or One Drive. We have had a huge debate over which

cloud storage site is best to use. We have not made our final choice and both have many benefits, thus the reason for the multiple "favorite application / program" responses.

The decision about which application to use will be a focus for this year's technology team. Thirty-three percent responded to the question about their "favorite applications" with twenty-two selecting Kahoots or Kidblog. Kahoots is an online practice program in which the teacher places standards or assessment questions for greater memorization practice. Kidblog is a platform for safe technology forums in which kids can communicate. One of the teachers responded that he used multiple applications and did not have a particular favorite. One respondent who does not have a class skipped this question.

Table 12

Survey Question 17: My favorite application/program to use is:

Teacher's Favorite Application/Program Responses	Response %	Participant Code
1. Edmodo	33%	A, E, I
2. Microsoft	33%	B, D, G
3. Google Drive	33%	A, I, J
4. Other: Kahoots, Kidblog	22%	A, G
5. Multiple	11%	C
6. Skipped Question	11%	D

Note. Question 17. response rate: of the 14 participants who were polled, 9 responded.

Question number eighteen was designed to align what the teacher likes to use with what the student likes to use. Four of my teacher respondents made this connection (44%), while five others thought of the students as separate entities (55%) and did not think of them as liking similar technology uses. The responses still indicate that students like to collaborate using the cloud collaboration opportunities. This is important to note as we move to staff development for a focus on technology inclusion. Three teachers chose Google drive, two chose Kahoots, Edmodo and power point and single teachers

listed single responses with one teacher just adding multiple meaning there was not a particular favorite. One respondent skipped this question for she is not a classroom teacher.

Table 13

Survey Question 18: My students' favorite application/program to use is:

Type of Student Use Responses	Response %	Participant Code
1. Google Drive	33%	A, F, J
2. Kahoots	22%	A, F
3. Edmodo	22%	A, I
4. Power Point	22%	G, I
5. Single responses including: Mathisfun, SnapChat, YouTube, Photoshop, Prezi	11%	B, E, G, I
6. Different - Multiple (the teacher was not specific on response).	11%	C
7. Skipped this question	11%	D

Note. Question 18. response rate: of the 14 participants who were polled, 9 responded.

Focusing on the greatest barrier for technological inclusion in question nineteen, the top two answers were divided into two categories. Forty four percent of the teachers focused on teacher training and 33 % of the teachers focused on the availability of devices. One teacher each listed; outdated devices and free range of student use. While BYOD does give greater access to the number of devices on campus, there is still a lack of the number of shared devices that are made available especially with the constraints of mandated assessments and testing. I noted the challenge for the need of updated devices in the "As Is" diagram under Appendix A and the need for staff development was under the "To Be" diagram in Appendix B. Using these diagrams help to focus on planning to address challenges that may become obstacles to the change process. One respondent skipped this question for she is not a classroom teacher.

Table 14

Survey Question 19: What is the greatest barrier to using technology within your classroom?

Type of Student Use Responses	Response %	Participant Code
1. Teacher training, trouble shooting skills and knowledge	44%	A, B, G, J
2. Availability of devices	33%	C, D, H
3. Outdated devices	11%	I
4. Free range of use by students (meaning student would do anything they wanted that was not teacher directed).	11%	F
5. Skipped Question	11%	D, J

Note. Question 19. response rate: of the 14 participants who were polled, 9 responded.

Questions twenty through twenty-three used a Likert scale, which is a scale that offers the respondent several choices as responses. In questions twenty on students' choices for completing projects, the technology choice was chosen 88% of the time. This response indicates the students do seem to prefer using technology when given a choice for project-based learning. One teacher who chose an art project was a math instructor who I observed as having used graph (poster) presentations most often. He did teach excel within his math class but did not implement technology inclusion on a daily basis. Respondent D was a technology specialist and E was a media specialist, yet both chose not to respond to this question. This question indicated to my study that teachers felt the technology type of projects were preferred by students to complete, when compared to the regular assigned projects such as posters, reports, hand-drawn brochures.

Table 15

Survey Question 20: If my students were given a choice to complete a project in class, they would choose:

Responses	Response %	Participant Code
1. An art project (poster, collage, game board)	13%	B
2. A technology project (iMovie, Weebly, Power Point)	88%	A, C, F, G, H, I, J
3. A speech or presentation (Book or subject report)	0%	-
4. Skipped Answer	25%	D, E

Note. Question 20. response rate: of the 14 participants who were polled, 8 responded.

Question 21 was on students liking the use of technology in the classroom and 100% of the respondents answered between the "Always" and "Frequently" response. These answers are relevant to my study in that the response of 88% preference for technology shows that a majority of the students would welcome technology options. This affirms my expectation that a technology rich BYOD classroom context would appeal to students.

Table 16

Survey Question 21: Student(s) have indicated to me that they like using technology in class:

Responses	Response %	Participant Code
1. Always	60%	A, E, F, G, I, J
2. Frequently	40%	B, C, D, H
3. Sometimes	0%	-
4. Never	0%	-

Note. Question 21. response rate: of the 14 participants who were polled, 10 responded.

Question twenty-two is purposed to reveal the percentage of students who own and used a device in class. The results indicate that 55% of the students bring a device to class between the ranges of 80% - 100% of the time. Four teachers responded that below 80% of them own or use a device in their classrooms. This question also supports the

need for establishing a plan for our district supporting the purchase of student-shared devices being made available. The other choice would be for our school to raise funds to purchase inexpensive devices (such as notebooks) or find and write a grant supporting this need. One respondent skipped this question; she is not a classroom teacher.

Table 17

Survey Question 22: What percentage of your students own and use a device within your classroom?

Type of Student Use Responses	Response %	Participant Code
1. 100% - 90%	22%	B, H
2. 89% - 80%	33%	A, E, J
3. 79% - 70%	22%	C, G
4. 69% - Below	22%	F, I
5. Skipped Answer	11%	D

Note. Question 22. response rate: of the 14 participants who were polled, 9 responded.

Table 18

Survey Question 23: I use technology with my students in class almost every day:

Type of Student Use Responses	Response %	Participant Code
1. Always	66%	A, C, E, G, H, I
2. Frequently	22%	F, J
3. Sometimes	11%	B
4. Never	0%	-
5. Skipped Answer	11%	D

Note. Question 23. response rate: of the 14 participants who were polled, 9 responded.

The survey process brought many of the challenges I had projected within my "As Is" (Appendix A) and "To Be" (Appendix B) charts. One of my greatest discoveries was the use of learning within the "cloud", which means using a cloud based storage site to collaborate, send, gather and respond to student and teacher postings. Teachers focused on this use and how it created forums for learning beyond the classroom walls. Due to these results, I will focus on developing staff learning components of using the cloud and

strive to support staff on using a consistent application on which site (Edmodo, Google Docs or One Drive) we will use for better student continuity.

Interviews

I interviewed eleven teachers and a district secondary director. I felt the evaluation interview process was important and would give me better insight on how the participants felt about the Bring Your Own Device (BYOD) program and the inclusion of technology within their classroom curriculum. I wanted to gather information on their cheers and fears on how this first year went and even how we might improve in adding needed changes and in promoting this experience to other middle schools. I hoped the district representative would give me information on the plan to encourage other schools to begin a BYOD program to be able to bring and use more technology within best practices in the classroom. Patton (2008) states, "A good interview often opens up or brings to the surface thoughts, feelings, knowledge and experience, not only to the evaluator conducting the interview but also to the person being interviewed" (p. 169). I hope my interview process helped the people I interviewed to reflect on how implementing these changes grew them in understanding the amazing journey they undertook. They are pioneers in our district for we are the first school to implement BYOD and to apply technology standards to our core curriculum classes. I will continue to strive for what Patton (2008) calls, "an instrumentation effect – an effect of the interview process and experience" (p. 169). Effective change can be repeated and should be as long as it improves a system. Wagner et al. (2006) defines, "the goal of change – improving teaching and learning" (p. 98).

During the interview process I wanted teachers to first reflect on the positive effects that technology immersion had on their classroom. My first question was: What do you think are the biggest advantages of using technology immersion within your classroom? Participants' response to this question was at 45% with teachers B, C, G, H and L commenting that they observed students learning to be independent and the skills they were learning through technology would prepare them for their futures in high school, college and the work force.

Another reflective A, E, J and K all listed increase in student engagement and participation as the biggest advantage they observed as a very positive effect at 36%. One teacher (.09%) spoke about the savings that would occur in printing cost for there was no need to make copies. She further discussed a student's ability to work from home even if sick for the assignments were posted by the teacher to the Cloud forum. Teachers were very focused on both engaging students today to prepare them for their tomorrow.

The district secondary director (x) thought that devices would, "engage student and enhance their educational experience". She felt it was the direction our district should be going. All of the participants focused on the positive attributes of the BYOD program and with training and monitoring, they felt this was an option for getting technology into the hands of students.

Table 19

Interview Question 1:What do you think are the greatest advantages of using technology immersion within your classroom?

Greatest Advantages Teacher Responses	Response %	Participant Code
1. Independence in student created projects and experience to develop skills was the main theme of these participants interview for question one. They also commented on meeting what students will need for their futures.	45%	B, C, G, H, L
2. Themes from each respondent indicated engagement and participation of students building problem solving and critical thinking skills as advantages.	36%	A, E, J, K
3. It will minimize the amount of copies and allow students to continue with class even though they may be absent.	.09%	I
District Secondary Director Response to BYOD Challenges	**Response %**	**Participant Code**
1. I think the change in instructional practices and understanding on how to engage students with their own devices really can enhance what we are doing in education today.	.09%	X

I believed that immersing technology standards into today's tight mapped out curriculum schedule would be a tough sale to roll out to teachers. In our first year of full implementation 2014-2015, I asked for teacher volunteers who were interested in joining the eSTEAM Academy (excellence in Science, Technology, Engineering, Arts and Math) and including industry certification (IC) technology standards within their core curriculum. I felt each teacher needed to create their own inclusion model but gave them a time-line for completing the IC standards. The second interview question I asked was: What do you think are the biggest challenges of using technology immersion within your classroom? The most common response (70%) was access to computers. Participants A, B, C, E, H, J and K all commented on all students not having the availability to a computer and having to share devices without the opportunities of bringing technology

home. Also, if a device were to not work it was a challenge not to have a "borrow" device so the student could continue with the lesson. Teacher A reflected she would also have "Plan B" in case all of technology went down and there was not access to be able to complete a lesson. She suggested having one paper version of the lesson in case the technology was inoperable. The other reflection from this answer was the students using the device inappropriately or even the differences among students on the levels of understanding they have of the programs the teacher wishes to use. Participants F, G, I and L all listed the students not always wanting to use devices for assignments but trying to sneak in games or YouTube videos when they were to be creating a presentation. This was a challenge for instructors that may be caught up in assisting a student with an issue and other students took advantage of this lag time to become off task. We problem solved this challenge and if a teacher believes a student is off task the teacher will ask to see the history of what the student was doing to see if the student indeed was off-task. The history is a button on the computer that helps you see the users' browser information. If the student was off task then classroom discipline steps are taken. This question helped us problem solve a solution to a problem teachers were having with students inappropriate use.

The district representative's question was, "What will our district need to focus on to be able to keep up with the growth in technology for 21st century learners?" This question was to gain knowledge on where she felt the district was and the limitations. Funding was the biggest need and so without it non-Title I schools had no resources for purchasing new devices. Our BYOD program came about due to this lack of technology. We are hopeful

this program continues to help bring technology to our campus for stronger student implementation.

Table 20

Teacher and Director Interview Question 2: Teachers - What do you think are the greatest challenges of using technology immersion within your classroom?

Greatest Challenges Teacher Responses	Response %	Participant Code
1. All students not having access to a computer at the same time. Most eSTEAM students bring their computer and use BYOD but sometimes the computer breaks or they do not work for various reasons and there were little "borrow" computers available. Teacher A suggested always having a back-up plan in a paper version form.	64%	A, B, C, E, H, J, K
2. Students using computers inappropriately such as; watching YouTube - which are on-line videos, or sneaking game play.	36%	F, G, I, L
District Secondary Director Response to District keeping up with Technology Growth		
1. The obvious answer right now is funding. The schools that are being hit the hardest are the non-Title I schools. The demands are currently for instructor computer improvements and student testing devices.	.09%	X

I continued the interview process and asked about the students understanding of the responsibilities of using BYOD and how the instructors helped them with this understanding. Fifty-five percent of the respondents answered through our school's digital citizenship program and it being reinforced through the discipline plan. Teacher A talked about in the beginning of school making sure you strongly reinforce expectations. She explained that if you see a student doing something wrong, you have to stop it and say, "Hey, this is not a good thing. Let's step back and maybe take away the privilege for a couple of days and talk about it." All six teachers spoke about having a plan and staying true to the plan and the consequences of stepping off the plan. The remaining instructors

spoke about individual experiences with reinforcing digital responsibility. However, the key response was having a plan, implementing and reinforcing the plan consistently.

The district director's third question was on possible suggestions for implementing industry certification technology within the core classrooms. The director thought this was a great question and she responded on how she was keeping the principals updated on industry certification and the acceleration points formerly given to the high school would now move down to the middle schools. In addition, she explained there should be extra benefits for the school grade if industry certifications were passed. She also explained that she was dedicated to this growth and had allocated 25 computers and an instructor to each middle school to help establish a lab to support inclusion of industry certification.

Table 21

Teacher and Director. Teacher Interview Question 3: How will your students understand the responsibilities that go with BYOD, how have you helped them understand those responsibilities within your classroom?

Teacher Responses: Students Understanding Their Responsibilities	**Response %**	**Participant Code**
1. All responses referred to the digital citizenship that is taught at the beginning of the year. The respondents felt this set the bar on students understanding the responsibilities. What was interesting is most (66%) of these respondents were 6th grade teachers.	55%	A, B, C, G, H, I, L
2. Teachers need to make sure they are consistent and uphold the rules. "If we are all not on the same page it is unclear for the students."	.09%	E
3. These instructors looked at what they did within their classrooms to assure understanding, F- "Constant reminders of my expectations." J- "I post everyday what we are doing for the day."	.18%	F
4. Teacher K is an 8th grade instructor and he felt the students monitored their own use and made sure that their peers were following expectations, "I think that because they are so excited to use it they don't want to lose it."	.09%	K
Director Response **Director Interview Question 3:** What would be some suggestions/considerations for implementing technology and including industry certification standards/ strategies so we have consistency within individual schools in our district?		
1. The director is committed to this inclusion and she designated computers and a teacher allocation to assist with this inclusion.	.09%	X

With so many new challenges facing instructors now that students are using and misusing devices, I believe it is a challenge that educators need to face head on. We have heard of new terms such as cyber bullying (bullying over social media), sexting (sending pictures or explicit requests or stories over social media) and many of our parents are clueless of the amount of time their student spend or what they are doing or being exposed to on social media.

With the BYOD program, we began a digital citizenship component so students could receive direction on how to handle all the information that was now at their fingertips and stay safe doing so. We also offer parents a "Parent University" in which they can learn about the different forms of social media and how to safely monitor their student and the people who they now "friend" (term used for accepting anyone into your electronic world).

Question 4 was about how our teachers grow digital citizenship within their classrooms. Thirty-six of the instructors responded that while they reinforce the integration of the responsibility of the uses and misuses they also rely on students self-reporting. We warn students that if they cannot handle this responsibility and they decide to misuse their device then they will lose rights to using technology on campus. Many students enjoy using technology that they report those students who are misusing. They also report other negative behavior incidents because one student listed the negative behavior on their Facebook.

The director's question was about what she thought might happen with technology within the next 5-10 years. She replied that she did not know the direction the nation was going in but she felt the State was headed to imbed technology into education. She cited the evidence being that the State targeted 2017 as the year we would move toward tech-books rather than textbooks. She thought the barrier to this plan was limitations in funding and she hoped that would be overcome.

Table 22

Teacher and Director Interview Question 4: Teacher - What have you used to grow digital citizenship understanding within your classroom?

Teacher Responses: Students Understanding Their Responsibilities	**Response %**	**Participant Code**
1. Four of the instructors answered this question focusing the responsibility back to the student. While integration and reinforcement is important, the students often monitor and teach one another. Teacher K "They self-report each other because they want to make sure the whole class doesn't suffer and lose privileges."	36%	A, B, C, G, H, I, L
2. Three instructors focused in on students plagiarizing (simply copy/paste) or cheating by looking up or informing others about test questions. They plan to make sure their students understand these parameters and what is and is not appropriate.	36%	E
3. One of these respondents was the media specialist and she plans to offer a session this year on digital citizenship. The other instructor plans to bring her class to the media center for this session.	18%	F
4. Uses websites that help students explore the possibilities of digital responsibilities.	.09%	K
5. This instructor is a new instructor and he suggested inviting someone in to teach students about digital citizenship and what is and is not appropriate or even dangerous.	.09%	L
Director Response **Question 4:** If you could see into the future, what do you think is going to happen with technology in our State /Nation in the next 5 years? 10 years?		
1. The director felt the State was moving toward technology inclusion and she cited the States push toward on-line textbooks called tech-books. She felt the on-line tech-books would enable current updates and have savings in shipping, printing and storage costs.	.09%	X

I asked each instructor if they had heard about challenges with BYOD and the technology immersion. I wondered if the instructors brought in previous hesitations as they began to imbed the technology inclusion into their core classes. Thirty-six percent of

the instructors felt students were freer with the use of their devices. Teacher K spoke about an example where he had given the student an art project using his technology but the student became off task looking at on-line videos. The student felt he should be able to look at videos for were they not research and was a video not art? While teacher K had to work out this particular situation (K was a new teacher) he had to make sure the student understood he would use his technology for the educational purposes of the assignment not what the student felt the purposes should be; or he would lose the right to use the technology at all.

Three teachers were worried about the lack of classroom devices. They were uncertain that enough students would bring a device to use. Without shared school devices, teachers were worried that it would be difficult to have technological assignments and what would the non-device students do? The reality was this was nearly a non-issue for the majority (80%) of the students brought devices to school. Students often collaborated and would share devices for most assignments were group projects.

Two instructors had not heard about previous challenges and were most excited about the potential on technology inclusion. The remainder of the instructors had individual responses. Instructor F felt the student excitement about using their device while at school overcome any thought of a challenge on his part. Respondent E was concerned about the inconsistencies of the teachers and the teachers' uses of technology in their classrooms. She had observed some teachers using it as a reward only without embedding technology into their classroom curriculum and instruction. Once the students used the devices as a reward and could use it for their games or look up videos the habit was difficult to change when the student entered a class where technology was part of the

curriculum and videos and games were not allowed. She felt these inconsistencies caused confusion in the students and was a challenge we needed to overcome.

Although we have implemented a BYOD use, policy some instructors are not following the policy parameters. The best way to change this is through administrators' support of proper use and training the teachers in how to best use technology in their classrooms for far greater engagement and enhancement of their lessons.

Table 23

Teacher and Director Interview Question 5: Teacher - With the implementation of BYOD last year, did you hear about any challenges while you were incorporating BYOD and technology immersion?

Teacher Responses	Response %	Code
1. Four teachers felt that students were freer with the devices this year and they seemed to feel empowered to use the device for non-educational purposes. They spent some time redirecting this behavior.	36%	A, C, I, K
2. Three teachers felt the lack of school devices worried them. They were not sure if students were going to be left out or left behind due to not having a device to use.	27%	A, C, I
3. No, they felt excited about the potential.	18%	B, H
4. This instructor felt the student excitement overcame any preconceived hesitations; they don't want to lose it."	.09%	F
5. The media specialist felt the lack of consistency from teacher to teacher was the largest challenge. Some teachers used technology for reward and did not use it for educational purposes. They did not follow through on misuse and let the students have too much freedom. Then when the student moved to the next teacher the inconsistency caused confusion within the students on what was the correct application.	.09%	E
Director Response **Director Interview Question 5:** If you could begin again, with no financial limitations, what would you do to prepare our district for the 21st Century technological boom?		
1. The director shared she would put in a technology lab in each school that would facilitate students but also train teachers in staff development "…to move forward and better prepare our kids for the future."	.09%	X

The seventh interview question was on how the teachers supported those students who could not afford devices. Sixty four percent of the teachers who I interviewed felt they had enough computers in their rooms to cover those students who did not have a device or whose device was broken or they forgot to bring a charging cord or forgot their device at home. Two teachers talked about loaning their own devices. These teachers had a lap top, phone and iPad and they were able to loan out their personal devices for students to borrow. Teacher J spoke to the science department with her concerns on lack of devices and the department came up with a solution to request that parents bring in their old devices and donate them to the school for student use. We would have to scrub the devices before we could put them to use but several of the technology specialists told the science department it was usably do-able. Respondent E's answer did not resonate with the other responses and I believe she did not understand the question.

> We are exploring grants and possible fundraisers designated to purchasing devices for classrooms. It is a project we will undertake in the next year cycle.

The director's question was on whether she felt the guest network provided the protection for student devices and if not was there another preventative measure. The director felt the network and student account platforms provided adequate safety for both the students and the student's devices. She did state, "On occasion you might end up getting some items through that shouldn't be", but she felt that all knowledgeable precautions were in place.

Table 24

Teacher and Director Interview Question 6: Teacher - How did you support those students who could not afford devices and yet wanted to participate in the BYOD program within your classroom?

Teacher Responses	Response %	Code
1. Seven teachers stated they had enough devices in their classroom for students to use if their device was broken or left a home. Most students brought their devices to school and did not have to borrow.	64%	A, C, F, G, H, K, I
2. Two teachers loaned their students their teachers' devices, which were enough to meet the need.	18%	B, L
3. Shared devices but planned with the Science department for a used device drive for next year. This plan would give parents an opportunity to donate their old devices to school.	.09%	J
4. Thought we could purchase APPS and then use the APPS on slower devices to help students have something to use. This answer was a little off of what the other teachers answered.	.09%	E
Director Response		
Director Interview Question 6: Do you feel placing in a guest network or other technological support in each school will provide students with filtration protection as long as the classroom teacher monitors it? If not, what might be another protection to prevent students using devices inappropriately?		
1. The director felt there were adequate protection measures for providing students with protections. She did state, "On occasion you might end up getting some items through that shouldn't be." She felt the district providing a student email account platform and providing the school with the protective filters should be overall adequate for preventing infiltration.	.09%	X

When I asked my teachers the qualitative question about how technology would affect our students' futures 73% felt that by using the devices students would be better prepared for their futures. They spoke about both life uses such as paying a bill to preparation for college and the work force. Teacher F stated, "They are getting in on the ground floor, it is giving them opportunities to learn and grow in using technology."

Individual responses included a teacher who took on the prospective of how the students look at the world and the fact that they would grow as global citizens learning to

relate to one another over technology. Another teacher talked about students learning that their iPhone was not just a communication device it could also be used for information. All of the teachers felt that using technology within the classroom would support their students and better prepare them for their futures.

The director was asked about the future of the tech-book initiative from the State and how we were going to prepare ourselves for students using tech-books. The director felt this initiative was already here for this year our math books only came with a classroom set and there was not enough money to purchase textbooks for every student to take home therefore they would have to use the tech-book should they need to have information on a math problem or practice.

Table 25

Teacher and Director Interview Question 7: Teacher - How do you think using technology in the classroom will affect your students' futures?

Teacher Responses	**Response %**	**Code**
1. Seven teachers felt that using the devices would better prepare students for what is to come. Whether it is paying bills on-line or researching information for a college project most of the teachers responded that what they were teaching students about using devices as an educational tool would continue and give students the opportunity to grow in expertise. Teacher F stated, "They are getting in on the ground floor, it is giving them opportunities to learn and grow in using technology."	73%	A, C, E,F, H, I, J, K
2. "They will be able to find different ways to look at the world."	.09%	G
3. "They have an opportunity to learn that their iPhones can be used for education."	.09%	L
Director Response		
Director Interview Question 7: What is being planned for in preparation for meeting the technology mandates that are being proposed by the State such as the Tech-Book initiative?		
1. The director shared that she is encouraging Principals to have more students use on-line tech-books for there currently is not enough funding to place a math textbook in every students' hands and have a classroom set. So on-line tech-books will supplement this need.	.09%	X

The responses to question number eight on what my teachers hoped to achieve from incorporating the industry certification into their classroom surprised me for many of the teachers talked about their own growth. They felt the industry certification standards gave them an idea of why technology was important to prepare their students with skills needed for their futures. The teachers began to take the certification tests and even came to school during the summer to try to pass the tests. They began to challenge one another and became competitive on who could master the certifications first. I was surprised by the teachers' interest in this pursuit.

Two teachers felt they needed more support on the industry certification standards. One of the teachers retired this year and the other began the process four months into the year. She saw what some of her other language department members were doing within their classroom and she asked to join eSTEAM Academy as an academy teacher. She grew a great deal on the pedagogy and best practices of implementing technology but she wants to further her knowledge in the incorporation of Industry certification to better prepare her students. The last teacher (L) is a young first year art teacher from California. He is very effective in the use of technology but he is most concerned of the behavioral effects that constantly having a device in ones hands may cause. He talked about being on a packed train headed for home and noticing a beautiful sunset. He looked around to see if anyone else noticed and only one elderly woman smiled and watched. All of the other riders were so busy on their cell phones they could not take the time to look around. He even tried to interest one person next to him but the person barely looked at the sunset and went back to his cell phone text. Teacher L

is concerned by how his generation is changing and he is worried that some things may become lost with the focus being so defined to using technology.

This question did have the most unexpected responses of any that I asked. I presumed the teachers would discuss the slow purchase of the industrial certification program and how difficult it was to implement due to the late start. Very little of those challenges were mentioned. Teachers seemed excited about the prospects this program would bring. I believe this reaction supports the blended model and I look forward to growing the program in the years to come.

The director's question was concerning the cost savings to the district on implementation of a BYOD program. The director felt there would be savings to our district in purchasing, repairing and maintaining devices. For these responsibilities would be with the families. She did however state that the district should make sure there are an adequate number of devices for testing purposes and she felt this was the district's responsibility to provide these devices and make sure they were kept up for easy testing availability.

Table 26

Teacher and Director Interview Question 8: Teacher - What did you hope to achieve by the blended model of incorporating the component of the industry certification within your classroom?

Teacher Responses	Response %	Code
1. Eight of the teachers spoke about their individual learning and how much they grew from the incorporation of the industry certification standards. They felt challenged and many did or plan to become fully certified. They also were excited to be able to align their standards to support what students needed to know to be able to expand into the workforce it gave meaning to the core standards in the "how" these standards would be used in the "real world". Respondent A stated that she would like to show there was a relevancy in integration of the industry certification standards. She feels that once other teachers see this they will follow for it benefits the student, and it is working in my class.	73%	A, C, F, G, H, K, I
2. Two teachers felt they were new to the program and had not fully implemented the standards within their discipline. They shared they planned on expanding this implementation in the next year.	18%	B, F
3. This respondent felt he did not want students to become overcome by using technology.	.09%	L
Director Response		
Director Interview Question 8: Is there a cost savings with using a BYOD program? What are some of the set up challenges on initiating a BYOD program or technology immersion within the classroom?		
1. The director shared that the savings would be in the district not having to purchase, repair nor maintain devices. The responsibility for the device is on the student. However, the director felt in terms of testing the district should incur the cost..	.09%	X

Question number nine was about the professional development the teachers felt they would like to see offered to better support using technology in their classrooms. Eight out of eleven teachers (78%) talked about wanting to grow in the use of cloud-based instruction through either using Google Docs or One Drive. We have debated whether to choose only one of these cloud based storage systems but even though we make a decision the question comes up each year as our district becomes more involved.

The other main request was on specific programs or APPS to use and the teachers would like to collaborate with each other on how to use these programs and APPS. Due to the response from this question, we will implement a new policy next year giving the teachers an extra day to be held for collaboration purposes.

The director was asked if there was anything further she wished to share and she said she would like to see more schools pursue the BYOD option for this would be a way for them to bring needed technology to their campuses.

Table 27

Teacher and Director Interview Question 9: Teacher - What area for professional development would you most like to have in order to support using BYOD in your classroom?

Teacher Responses	**Response %**	**Participant Code**
1. Eight teachers wanted to know about teaching in the cloud storage through either Google Docs or One Drive. They also would mention using and sharing particular APPs and programs.	78%	A, B, C, E, I, J, K, L
2. Three teachers were interested in the industry certification inclusion aspects and how to embed the industry certification standards into their projects.	27%	F, G, H
District Director Response **Director Interview Question 9**: Do you have any other thoughts on the BYOD program that you wish to share with me?		
1. The director felt this was a positive program for our district and that other schools should implement because there is no other way to bring in up to date technology.	.09%	X

The last question I asked my teachers was if there was anything they would like to share with me on their experiences with BYOD. All eleven teachers talked about what a positive experience this had been for them. They were looking forward to growing the program next year.

Some of the individual responses included the teachers talking about individual experiences they had had within their classrooms. Teacher A shared that she had added a student leadership team that had named themselves "Team Tech". The team was made up of seven members (6 boys and 1 girl). These students gave her the opportunity to try new ideas with them; and they would analyze the strategy or use of technology expressing how they felt it went. They began to give the teacher specific feedback such as, "this is great but you have to use Google chrome and you have to make sure students don't have their 'pop-up' blocked." The students began to problem solve and offer the teacher specific advice for success. We also had this leadership team present to incoming 5th graders on what the eSTEAM Academy was all about and even offered a teacher and parent learning session, which we called "universities". The students gave up their lunch in the cafeteria and ate together while they held their meetings. We also met with 'Team Tech' over the summer to plan their year and grow their leadership skills. This was an amazing experience for Teacher A and she is anxious to grow another leadership team in the upcoming year. Teacher A does not give a grade or any extra credit to Team Tech members. They only get the pride they feel with being able to participate in this leadership role. She shared, "They can be proud in helping grow a program like this and they enjoy working with one another." Teacher A further concluded, "So, I would say that they are either self-motivated already or they are motivated by technology."

Table 28

Interview Question 10: Do you have any other thoughts or experiences from this year on BYOD that you would like to share with me?

Teacher Responses	Response %	Participant Code
1. All eleven teachers talked about their positive experience during their first year. While many of the lessons were very individual to each teacher all shared the positive outlook.	100%	A,B,C, E, F G,H, I, J, K, L

The interviews provided tremendous insights to me into how teachers felt about the eSTEAM Academy. The face-to-face intimacy was an outstanding way to really delve into both concerns and cheers on how we could continue to grow and flourish. The secondary director seems to support our efforts and other schools have begun to contact us to assist them in implementing a BYOD policy of their own to grow in technology inclusion.

Observations

I was unable to accomplish as many classroom walk-throughs as I had designated within my IRRB due to the late start of my change leadership process and the testing schedule for End of Course (EOC) exams, Florida State Assessment schedule and the Industry Certification testing calendar and implementation of the testing plan. I did, however, complete fifteen classroom walks on thirteen different instructors, four of whom I completed two walks and listed the results in Table 29. I was looking for student engagement by counting the number of raised hands to a teacher's question. The teacher was asked not to prompt students to gain greater response and to not allow for a large amount of wait time following the question. I have charted the results of the total number of students present in the classroom and the number of hands that responded to a teacher's initial question. This quantified a way to monitor student engagement. I

compared the number of student's wanting to respond to a teacher face-to-face questioning process with the number of students that responded to a technology request either through Poll Everywhere or Cloud use questioning. I previously gathered all documentation as required by the IRRB process and secured teachers signatures for proper documentation purposes. On the designated tables, I was able to walk four teachers twice so I gathered their data during both walks. The average number of students' responses through raised hands was 4.6 times. Most of our classes are capped at 22 students per class and my total number of students present aligned with 22 being the average number of students present within the classroom. However, the number of students present was dependent on absenteeism and two of the classes did not follow the 22 cap due to being technology and art classrooms, which do not have a mandated limitation (cap) of the number of students allowed.

Table 29

Student Response to Teacher Question as Observed During Walkthrough

Date	# of students in class	Question Posed by the Teacher (Three teacher questions observed per visit.)	# of students who responded to a teacher question
5/20/15	22	A: Who would like to do number 2?	7
		Who would like to share number three anyone else?	8
		How many did digital?	5
5/20/15	22	A: Who would like to answer number 1?	5
		Who knows the relationship between 1 and 2?	6
		Who thinks their child is the smarter of the two?	8
5/22/15	20	B: How many of you got 5?	2
		Who can do the next problem?	3
		Who can help him?	4
5/20/15	22	C: How many Hg are in 346.Cg?	5
		What does a gram measure?	5
		Who can answer 16.35dm to cm?	5
5/21/15	22	C: What's the first thing you are going to do?	6
		Who has paper essays?	7
		How will you put a comment?	8
5/13/15	21	F: Who knows what the author meant by that word?	5
		Was the character angry?	7
		How do you know?	7
5/21/15	21	F: Who can help with this answer?	2
		What did you find out?	3
		How did she know that?	4
5/12/15	22	G: Who can tell me what type of engine this is?	7
		How do you know?	6
		What is a piston?	6
5/12/15	22	H: Who has that on their screen?	6
		Who can tell me where __is located?	3
		Is it a democracy?	8
5/22/15	22	H: Do you know what causes hurricanes?	7
		What did we study about weather?	7
		How does that relate?	5
5/19/15	22	I: Physical Science includes?	5
		What does the word Bio mean?	4
		What about Geo?	4
5/18/15	22	J: How many have completed this?	4
		What do you know about this item from sight only?	3
		Where might you find this creature living?	4
5/14/15	22	K: What is the main reason for this idea?	6
		Why do you think they felt this way?	7
		How could they have had a different outcome?	7
5/21/15	25	K: What did he do for our government?	3
		Who did he tell that too?	2
		Where did he go wrong?	4
5/20/15	25	L: What type of art is this?	2
		How was it created?	3
		Why did the artist use this pallet?	2
TOTAL	332/15=**Average: <u>22</u>**		207/45=**Average: <u>4.6</u>**

I only had three teachers give me students' responses on a technology posed question and posted the results in Table 30. All three teachers reported 100% participation. I found it ironic that while I was describing this data process to a teacher before completing the walk, teacher (N) said, "But, that is not fair- the students like using technology more than they like it when I orally question them".

I would have liked to have gained more data through using technology than only three responses but this put a burden on the participants to report back on their use of technology results, which proved difficult to accomplish. I could not gather this data through simple observation and had to ask teachers to provide me with the outcomes. In the future, I will ask if I could be placed on the Cloud forums so I can see how students are responding. This option may give me a way to monitor student response in the future without placing a burden on the instructor. If I could see how many students participate in the collaborative high order questioning that the teachers submits, I could simply count the responses and compare them to the total number of students designated for the particular class.

Table 30

Technology Mode Questioning Results

Date	Number of students participating	Teacher posed question	Number of students who responded
5/12/15	21	H: Where is - located and is it a democracy?	21
5/14/15	22	K: What was the main idea?	22
		Why did they feel this way?	22
		How could the outcome have been different?	22
5/21/15	22	K: What did he do for our government?	22
		Who was also involved in this decision?	22
		What could he have done differently?	22
TOTAL	65/3 = **Average: 22**		65/65 = **100% participation**

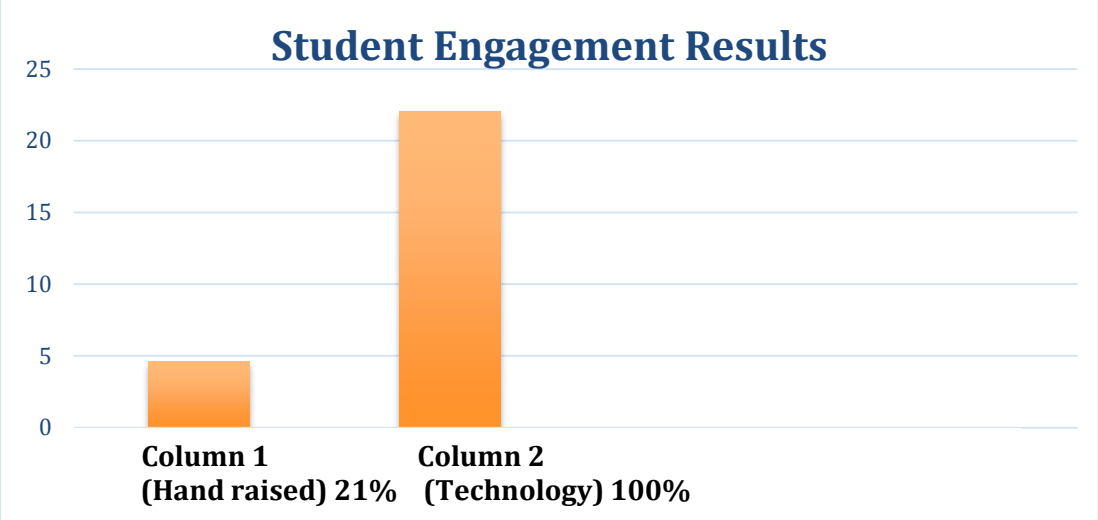
Absenteeism would not affect the total number of students because students could complete the question from home and would not need to be in attendance in class for the teacher posts this to the cloud forum for all of her students to see. I had not considered this affect and it was one that the teachers thought of as a positive impact for technology implementation had little loss of student academic participation.

The graph in Table 31 indicated the difference in the results between a teacher posed question in the classroom during lecture as compared to a teacher posed question using technology. The teacher was directed to only pose the question once so the data would be consistent. The student responses within the lecture model were on average at 21%. The student responses within the technology posed question resulted in 100%

participation. This data indicated that student engagement increased when technology was used.

Table 31

Student Engagement Results Comparing Hand Raised Responses to Technology Responses



Assessment Comparison

There was only one qualitative assessment for only one benchmark test was given during the 2014 and 2015 school year. The Table 32 results of my comparison group looked promising but I was unable to compare growth due to only one assessment worth of data. I used the highest achieving score (84.5%) as a 100% score and compared the other classes to the highest achieving class, the gifted eSTEAM class. Students in the eSTEAM technology enhanced Language Arts (LA) classes out performed students in the traditional Language Arts (LA) classes on the LA benchmark test by the overall average of 1.3%. Another data point to reflect on is the difference between the Gifted Traditional LA class and the eSTEAM Advanced class was only .8%. At my school gifted core

classes are created for the highest performing students to challenge their specific needs. Yet, the advanced eSTEAM class scored near the gifted core class with < 1% difference.

Table 32

First Quarter Benchmark Assessment Comparison Data

Course Class	Results	Difference with 84.5%=100	Overall Average of Non-eSTEAM compared to eSTEAM
Gifted LA Class	81.9%	-2.6	**81.5%** non-eSTEAM Overall Average
Gifted eSTEAM	84.5%	0	
Advanced LA	80.4%	-4.1	**82.8%** eSTEAM Overall Average
Advanced LA eSTEAM	81.1%	-3.4	
Difference Non-eSTEAM compared to eSTEAM = **1.3%**			

Table 33 reports a list of student who took and passed the Certiport IC3 (Internet and Computing Core Certification) test. Forty-eight students took the IC3 certification and sixteen students passed at a 33% pass rate. The industry certification test (IC3 Internet and Computing Core Certification) was given once during the last week of school. A school is able to give the test three times per year in order to remain eligible for

State points and dollars. We were not able to give the IC3 test that often due to the district not purchasing the 12-month Industry Certification Certiport program until late January and releasing them to schools for downloading in February. Teachers began the program in late February and tested in the first week of June. We also were not given direction that there were two versions of the IC3 test. One version was for PC (Personal Computer) or Windows users and the other for MAC (Macintosh an Apple product) users. With having BYOD on campus our students were mainly users of one or the other of these systems. Unfortunately, we gave the same test to all users and figured out later that the wrong test was given to some of the students. The version of the test was separated due to the computer manipulations being different between the Windows and Apple versions. I expected the results to be far fewer then what was accomplished due to the late introduction of the Certiport system and the incorrect test being taken. I was very pleased with the number of students (33%) who passed under these extreme circumstances.

We plan to change the late start next year through using the Certiport program from the beginning of the year, due to the five months remaining on the Certiport contract. We plan to give the test for the first try at the end of the first semester. We will also poll the students to find out if they are more comfortable using a PC (Windows) or MAC (Apple) and give the students the correct version of the IC3 test. It is our hope these changes will result in more students passing the IC3 test. Another impact of future potential results is that we will be offering every sixth grader the opportunity to take the IC3 test and will be hiring an instructor to specifically teach students the IC3 standards and career pathways that align with IC3 (internet) certification.

Table 33
Industry Certification Test Results

Number of students tested in IC3	Number of students who passed IC3	Percent passed
48	16	33%

Unfortunately, the State Assessment scores will not be released until much later in the year, therefore, I was unable conduct an analysis of state assessment student achievement data. This was an unexpected occurrence which limited some comparison result options. I feel it is important to look at this type of data and will continue to monitor results as more information becomes available.

Interpretation

The results of my teacher survey data gave me insight into the importance of applying a focus on staff development. The time commitment for staff development was a particular challenge with union rules, which includes the amount of time allowed for teacher training limited to one hour per week. This created a need for teacher technology training to be on a volunteer basis, thus each teacher choosing to dedicate extra personal time for this training. It was not within my ability to choose the implementation of technology as a school wide goal, so the teachers' willingness to dedicate personal time was the only solution. Teacher training should include how to handle students off task behavior and misuse of technology as well as training on students uses of technology. Finding the opportunities for teachers to share and collaborate on new programs or uses is essential for continued growth. Technology is moving so rapidly that keeping up means consistently exploring new applications

The significance of this data really gave me insight on creating a plan for change and the significant need to plan for continuous training. The time needed to implement this plan required me to have to monitor and continuously cultivate (Wagner et al., 2006) "4 C's - competency, conditions, culture, and context" (p. 98). Moving from competency in the building of skills for teachers, to creating a culture in which shared values and expectations became a constant required understanding the conditions on how this shift could occur. As the administrator, I met consistently with my teachers encouraging them to give their opinion on how to overcome the challenge of collaboration and training one another. Once culture began to be established, I had to back off and let them develop their own opportunities for accomplishing the context of the students and parent expectations. Students were growing in skills so rapidly that my teachers had to give up the controlling teacher stature and switch to a facilitator who was willing to learn right along with their students. When a teacher made this switch, the students felt empowered with their own learning and began to offer suggestions for improvement. Students monitored each other for appropriate use and felt strengthened by increasing their knowledge in using technology for their everyday classroom activities such as note taking, collaboration and project assignments.

To ask myself why my change leadership plan data turned out this way most definitely lies with the building of a change culture. At first teachers were caught up in the fact that students all needed their own device to be able to include technology within the classroom. As teachers began to explore technology inclusion, they found students could share devices and the process of inclusion enabled them to gain the "hook" needed for students to become more engaged. Students and families were interested in bringing

technology into the classroom. Technology use had become a huge part of their everyday lives so using technology as a tool for learning seemed to be a natural transition. Through this technology use, I observed students becoming far more engaged in what teachers were assigning. My classroom walk-though data indicated students' willingness to participate in class once a technology tool was the mode for response. It moved the teacher lecture portion of the class to an interactive session in which questions were quickly assessed for understanding. Technology programs such as "Kahoot", which is a game based learning program in which the teacher puts in relevant questions and students respond in a fun-game like learning opportunity, really increased student participation. With the increase of student participation, I observed the assessment scores increasing. The inclusion of technology created a ripple effect in the growth of student learning. I would compare it to reading a book of choice as opposed to one mandated to be read by a teacher. In having a choice of what you want to read you might find a series of books or an author you really like. In reading an assigned book you read for information purposes and follow along until the assignment is complete. If asked, "What is your favorite book?" rarely would one mention the assigned book. When students were given the choice of using technology to complete a project many students made the choice that technology was the best option especially when it came to group project assignments. Technology allowed for students to "meet" at their own time but in their own homes. They did not have to travel to meet one another to work on a project and therefore it took away the stress of having to rely on a location and scheduling time when everyone could collaborate outside of school to meet to enhance a class project. The other unexpected plus was that students who were absent due to illness or travel could participate in class

and in groups because they could skype (an on-line video/audio call) into the class and be a part of the session. Teachers began to post assignments on web sites that had attached tutorials to help struggling students with a difficult concept. These videos were often created by classmates as a homework assignment and posted by the teacher for those tutorials that were most informative.

The context for use was a plus for all stakeholders. My school has a great number of competitive student athletes and traveling circus performers. These families must travel for a living but prefer not using on-line courses for student teaching. They want their children to have the "school" experience and the social interaction that comes with attending school. Parents also felt that the program prepared their students for future learning opportunities in high school, college and the work force by learning programs that they may use as they progress in opportunity.

The full context came from the addition of the Industry Certification standards as technology goals within the core classroom. Giving a direction in the form of standards, to the ever-changing technology skills, really helped establish a substantive goal. The Industry Certification exams as well, gave extra points to the school grade assessed by the State and returned dollars back to the district through the State offering a program, with attached dollars, to encourage technology inclusion into core classroom experiences. Parents understood the need for their student to learn skills such as word processing, excel spread sheet, photo shop and web design to name just a few.

The context for this change leadership program was an understood goal for all stakeholders and offered students the opportunity to become certified in industry technology that was recognized by the business community. Patton (2008) teaches four

distinct evaluation processes, "analysis, interpretation, judgement and recommendations". He further writes that all primary users should be involved in this process for full understanding and implications of the findings (p. 478). In my study I shared the results of the analysis of the survey, walk through and State Assessment data. I worked with my instructors on interpreting this data and asked them why we saw increases in assessment scores of students who were in the eSTEAM Academy when compared to students who were not? One teacher stated, "Well they like using technology and therefore participate more." I pondered on this response and thought to myself, "Then why not incorporate technology?" We had discussions on what worked and did not work within classrooms and we included students and parents in the conversations for future program expansion. We created a student leadership group who would try out a new APP or program and report back to us judging the pros and cons of use. The student leadership team also presented at school parent information sessions and led others into understanding the benefits of using technology in class. The students would make recommendations to the primary eSTEAM teachers on what they felt should be changed for betterment of the program. Through this progressive relationship, one of our parents volunteered to teach coding to our students, which now includes elementary students and high school students joining the sessions to enhance greater understanding beyond our middle school program.

As one of the first schools to implement BYOD in our district and an eSTEAM Academy, which included technology in core classrooms, we demonstrated through creative and progressive 21st Century, technology rich programming, the potential of change leadership. Since implementation, multiple district schools have begun a BYOD program. Sharing with our district on what can be done brings this potential to other

schools that may have an interest in incorporating technology into their core curriculum. We are excited to see where this program may take us as we continue to revisit applicable change together for continuous betterment of this program.

SECTION SIX: A VISION OF SUCCESS (TO BE)

The overall goal for my "To Be" model (Appendix B) was to encourage a larger number of instructors to use Bring Your Own Device (BYOD) and grow and develop in adding technology standards inclusion into their core classrooms creating a 21st Century paperless learning environment. We created an eSTEAM (excellence in Science, Technology, Engineering, Arts and Mathematics) Academy for this purpose and students interested in technology use within their classes, applied to become eSTEAM Academy members. eSTEAM Academy teachers volunteered to become the academy teachers, which meant they would implement technological Industrial Certification standards into their core classroom standards with the purpose of becoming paperless and using a blended model of face-to-face instruction with technology entrenching. The ultimate goal was the students would pass both an industry certification and the State Assessment test. The pilot eSTEAM Academy program began with two eighth grade teachers during the 2013-2014 school year. During the 2014-2015 school year, we implemented the eSTEAM Academy across 6th, 7th and 8th grade with fourteen teachers becoming academy teachers. The expansion of the program was achieved and we met the challenge of our overall goal, which was to expand the number of teachers who were using BYOD and applying it to technological inclusion within their core curriculum.

Contexts

Under my Contexts heading within my "To Be" diagram (listed in Appendix B), I identified four vision statements:

- Teacher support using technology to develop students' growth as 21st Century learners

- Economic support and savings of using BYOD, including upgraded computers
- Request greater district support for technology application
- Support of Industry Certification application in academic course project based learning

The four crucial supports presented in these statements are teacher support, economic support with cost savings calculations, and support for Industry Certification process including implementation of project based learning curriculum materials.

Context Supports

Teacher support. The teachers needed support to use technology within their classrooms in the form of both training - such as industry certification standards and APP and program uses, processes - such as the policy and district personnel meetings and equipment-such as the guest network and support equipment. We created an eSTEAM team collaboration that met once a month for the first six months (until the Certiport testing program was purchased and loaded) and then met once a week for better support in training teachers on APP use and inclusion of technology standards. At the last month of weekly meetings, we included five new teachers who would be developing inclusion models into their classrooms during the 2015-2016 school year. Because of the responses to my survey and interview questions, I determined that the teachers would like to meet often as a means for greater support. We asked the leadership team to move from one teacher planning and collaboration day to two days, and it was approved. Therefore, next year we will not hold parent / teacher meetings on Wednesdays nor Fridays. Wednesdays will be for district and school professional development and Fridays will be dedicated to teacher collaborations, which will include eSTEAM Academy and technology inclusion.

District support. Before beginning a BYOD program, the administration went to the district and met with district personnel on gaining an approval of implementation. We reviewed what would legally in the form of policy, contract and information that would be needed to begin this pilot. I worked with my technology committee to write all of the supporting documents and then I submitted them to our district. The pilot was then approved by the school board.

Cost support. I requested a guest network on which the students could securely operate personal devices. This network costs were around $23, 237 that included the switches, radios and installation for 130,000 square feet worth of buildings. The network enabled the students to safely use their devices under the protection of the school district filter system. This application gave as much protection as possible to virus intrusion and non-educational communications or searches both in and out of the network server. The server strength must continually be monitored for adequate use ability. As more students bring devices on campus for educational use, there is a greater need for server capacity. According to a *Campus Technology* White Paper (2015), "Today, mobile devices are as much of a part of students' learning as the chalkboard was at the turn of the 20th century" (para. 3). With increased use comes increased demand and so it will be very important for schools and districts to plan for and finance updates in server power.

District economic savings and support. Administrators and the technology team created a BYOD policy, presentations to teachers, students and parents about the expectations of use. The district first approved a pilot BYOD program and the legal department reviewed the pilot BYOD policy that would release the district from any costs associated with a student bringing a personal device on campus. The revised and current

BYOD policy can be found in Appendix E. We continue to revise the discipline plan and matrix that is approved by our schools discipline committee. The BYOD program was be a huge savings to our district, for there was no need for purchase, maintenance or replacement (for lost or stolen) new technology devices. Our school has not received new devices for student classroom use in two years, yet we have been able to have upgraded computers in students' hands due to the BYOD policy.

Industry Certification support. Industry certification standards are embedded within our core curriculum classes. During the pilot year we had technology standard inclusion in only the 8th grade. Out of 42 students 41 students achieved industry certification in Photo-Shop level 3. This year the State increased the level of Photo-Shop from CS5 to CS6 and we had five students become fully certified in CS6 out of 56 who took the test .08%. In IC3 – the 6th grade test we had 26 students pass out of 44 students in the program or 59%. In IC3 for the 8th graders who tested 12 out of 32 students passed or 38%. Seventh graders did not test.

Table 34

Industry Certification Data

2013-2014 Grades	**Number tested**	**Number passed**	**Total %**
8th Grade Photo Shop CS5	43	42	98%
2014-2015 Grades			
6th Grade IC3	44	26	59%
8th Grade IC3	32	12	38%
Photo Shop CS6	56	5	08%

The differences in the pass rate was due to not receiving the rights to the Certiport programs until January of the school year and changing the Photo Shop from CS5 to CS6 which is a huge update in test requirements with little preparation time. The 2015-2016 school year will be the first year of full implementation with test application programs available. Now that we have implemented our first year, we have created a curriculum map for Industry Certification Standards for better understanding and pacing. This will organize the technology inclusion model and set the general structure for the 2015-2016 school year. Our goal for creating the curriculum map was to develop what Wagner et al. (2006) calls, "communities of practice" which, "promote engagement by providing forums for professionals to learn, grow and become more effective at their craft" (p. 75). The curriculum map will set our academy up for greater effectiveness and understanding of their purpose, design and a timetable for greater levels of student engagement and achievement.

Competencies

Under the Competencies component of my vision concept (within my "To Be" diagram in Appendix B), identify four fundamental competencies:

- Support teacher's growth in the use of technology within the classroom.
- Develop pedagogy PD of monitoring bandwidth
- Develop procedures for downloading text and material during planning time avoiding over-use of internet
- Create a technology committee able to train and support teacher's use of technology in the classroom (include students)

These competencies include supporting teacher skills in the use of technology as instructional tools, the ability to closely monitor and anticipate bandwidth issues and strength, strategic usage of internet for lesson planning and class preparation, and a capacity-building team available to teachers for training and technology support.

Competency Support

Support teacher's growth. Most of the understanding of supporting my teacher's growth came from holding and attending eSTEAM technology committee meetings, sending out a survey and holding one-on-one interviews. We do have union rules to follow that prohibit an administrator from calling a mandatory meeting so all of these meetings were voluntary. The teachers asked for a day that would be made available for teacher collaboration opportunities. Our leadership committee reviewed this request and approved that we would pull out a day a week, free from scheduled parent/ student meetings to give the teachers' time to collaborate and share ideas. With the time factor being lifted, our eSTEAM committee met once a week to learn and share new applications. The survey I gave reinforced these conversations listing teacher training as the main barrier at 44% (Table 14). These collaborative opportunities gained momentum in the support of teacher learning growth opportunities and provided them with the support of their peers and administrator.

Developing the pedagogy and monitoring of bandwidth needs often came out of the weekly meeting conversations. Alternatively, sometimes my instructors would come to my office and share concerns or challenges with our server speed or information dropping and use lagging. When this would happen I would contact the district and they would send out a technology support person to measure the bandwidth use to better

problem solve what the challenge might be. With these requests, we gained in the installation of radios and switchers to better boost our signal and we are on a list for an upgrade to our servers to better give the availability for greater speed and accuracy.

The pedagogy of use came from teachers sharing and visiting each other's classrooms. As this continued to grow and share the systems for signals and generic classroom management components the challenges with students using technology began to diminish. Some of the strategies included placing students in groups with a technologically savvy student leader, developing silent help signals for teacher support needs, applying timing devices so class is not caught off guard without packing up devices properly. The tools for these and many other challenges were solved through open-ended conversations between teachers. At the beginning of the 2015-2016 school year, we have begun to collaborate during the summer months and we are holding a student training session to develop student technology leadership teams to support teachers, train fellow students, teachers and community reach out in hosting a technology university in which parents and community members come to our school to learn more about their devices and how to monitor and protect their student from becoming involved in technology misuse issues.

Procedures. Much of our bandwidth was being used up in downloading YouTube (on-line) videos and free programs and APPS. We developed the protocol that this type of discovery needed to happen before or after school when less bandwidth was in use. The simple change to this process gave us more efficient bandwidth capabilities for greater speed and accuracy of delivery for classroom internet searches for project based information. According to my survey results, internet use for information and

collaborative purposes was one of the largest student uses of technology use (Table 13) through Google Docs which means students collaborating in a secured cloud (teacher created and password protected) or searching the internet using Google on the guest network (protected by district technology system).

Create a Technology Committee. The eSTEAM Academy teachers became the technology committee. An eSTEAM teacher called for a voluntary meeting of any teachers interested in becoming an eSTEAM Academy teacher or even those interested in growing the use of technology in their classrooms. A teacher makes this request for this takes off any pressure from the union that administrators are pressuring teachers to meet under their designated planning time. These meetings are run by one of the eSTEAM teachers dependent on the subject or learning experience they wish to share. Each teacher has expertise in different areas of use. The eSTEAM committee also wears the designation as the technology committee so all technology equipment or systems applications are approved by the technology committee. This gives a way for purchases to be designated for specific learning or teaching need applications. We have found that sometimes we already own the equipment and there is no need to purchase extra for we can switch out material that someone is no longer using. The technology committee organizes our technological purchasing and develops a plan for best practice use and growth.

Our student technology leaders review and pilot new APPS or programs that we may consider for purchase. They make their decisions on how they think their fellow students may apply the use to benefit engagement or enhance learning. The students also understand the limitations of the different recommendations such as older devices will

not be able to run the applications and they list that as a challenge so the teacher will understand he or she may have to "buddy up" and group-share devices if certain programs are used. The students also then are extra assistance within the class if the teacher decides to choose to try a new application of some type.

Culture

Under the Culture heading in my "To Be" diagram (Appendix B), I identify four culture needs:

- Staff development to support teacher's use of technology (include student's as leaders/trainers)
- Staff development on computer use pedagogy within the classroom
- Dedication of time for training teachers on technology use
- Create a team of successful teachers to share classroom technology use experiences (include students)

Culture Supports

The cultural needs were very similar to the competency needs. Competency building informs school culture and school culture builds competency. In this case, the culture of a technology rich environment and the competencies required for a technology rich environment go hand in hand. Wagner (2008) reinforces this conception in his assessment of cultural development as a core competency. He uses the example of providing a school culture in which individual diversity is accepted. He makes the point that core competencies are linked to being able to embrace and accept diversity. In our case, I apply this to a change to the ability to accept technology use. In Wagner's example, he is referring to the ability of the school community or culture to embrace

other ethnicities: "…understanding and appreciating diverse cultures are additional core competencies that all high school graduates need to master" (pp. 24-25). Understanding and appreciating the potential for, and the use of, technology is an additional competency for the school community to master in order to establish and to embrace a technology rich culture. Therefore, my "To Be" vision for both culture and competencies are very similar in purpose, but differ in actions: the difference being that competencies were about the "what we did" to make it happen (knowledge, skills, capacity), while our cultural context is the consensus building and collaboration involved in "how we did it". The success of the culture change depended on the positive reception by the stakeholders and community of the new technology, the change, and the technology rich culture. The culture change depends on the people who are to live and breathe the new culture. This entails effecting change in perceptions, expectations, and, in this case, supplying the technology needs. Support for the culture change process depends, in a great part, on competency with technology. In this way, culture support is very similar to competency support for effecting this change process.

Support of teachers' use of technology. In findings gleaned from my conversations with teachers, the consensus is that teachers felt that we did fairly well as far as meeting their technology needs. In part, I base this moderate success on the fact that no teacher requested to leave the eSTEAM Academy, even though we had a challenging first year. During the first full year, due to delayed district purchase of the application system for technological industry certification that we needed for the project. Other capacity building difficulties emerged yet we problem solved challenges by creating an open culture of sharing to transform the roadblock into a positive experience.

Computer use and pedagogy. I believe we still have challenges on the computer use due to lack of devices on campus and the funding for network increases, projectors, printers and other supportive equipment. We have grown on the pedagogy of the inclusion of technology within our core curriculum classes. We enhanced these efforts through many of the competitions we entered and the success of our student's projects. We are currently ranked number one in the nation for our Technology Student Association (TSA). Our TSA won World Vex, which is a technological robotic competition. The level at which our students are able to compete is an indicator of the processes and computer skills that they have mastered.

Teachers and administrators continue on supporting the pedagogy that needs to be in place for computers to be used successfully within classrooms. We are offering training at the beginning of the year on specific programs, APPS and best practices that experienced eSTEAM Academy teachers have used and students enjoy. New teachers are interested in created the collaboration components within Google Docs so we have planned professional development opportunities to meet these needs. We continue to question, assess, plan and approach this program. Through a strong team effort, we will grow into a model technological school.

Training. I feel it is important for teachers to have the opportunity to be trainers. This encourages and grows leadership qualities within teachers and creates a sense of confidence. Wagner, et al. (2006), bullets this point as an identifiable outcome for successful completion, "Educators who understand the importance of developing all teacher's skills, as well as the skills of administrators as instructional leaders. There is an emerging and concrete vision of good instruction" (p. 145). I believe we did well in

creating a teacher leadership team. When we first began this model, I would create all the agendas and chair all of the meetings. At the end of this year, one of the teachers hosted the training sessions and created the agendas. He did this on his own seeing the need. This action alone shows the buy-in of teachers to work to establish and promote training opportunities for their peers.

Teams. Several team opportunities have developed with the BYOD and technological inclusion program. Teachers and administrators have created a strong focused team that established goals for success. We continue to assess and redefine these goals as we learn through this process. We are the pioneers on this journey and therefore we learn what works and does not work through a trial and error process. We do not focus on the errors, but learn from them and reevaluate and adapt to shape success. We have created a technology inclusion curriculum map; we are anxious to try out. We had no previous district input and have had to develop this process without losing the momentum of student progression within the core standard mastery. We have accomplished this goal and look forward to a smoother journey in the year ahead due to now having created a map in which to follow for greater vision alignment.

Students have a leadership team as well. Students present the BYOD and eSTEAM Academy expectations during school choice night. They talk about what they have learned and on their successes achieved through using learning technology in the classroom for presentation of the core standards. They field questions from audience adults and students alike and present the program in an upbeat exciting manner. Student technology leaders (6^{th} grade is called "Team Tech", 8^{th} grade is called Awesome Bosses) assist other students during class and also tryout and report on new APPS and programs

they have discovered. They present some of these to the teachers and explain to the teachers why they like certain APPs and programs. The technology leadership teams also host a Parent University in which they invite parents and community members onto campus for an evening of "how to use their technology". They also teach parents about monitoring electronic devices and what students should and should not be visiting for security reasons.

An unexpected stakeholder has come from a parental support team. One parent volunteers to teach a coding class before and after school. Other parents come after school to support competitions and give their expertise on programs and processes that they use in their working environments. Parents even purchase devices for students who cannot afford a device. They come, ask to do this anonymously, and as one comment stated,

> I was a single Mom and could not afford to give my student supplies for school. Another parent found out and purchased supplies for the entire year for my child. I never forgot that! Now that I can afford to help out another student, please let me do so by offering to purchase a lap top for the student with the greatest need, yet most fervent desire to better themselves. (Anonymous Parent Comment)

The parents' support in time and in money was most unexpected. They currently often email me to share something that happened at their home that surpassed their expectation or that their student shared. They are so pleased with their students' engagement and progress and they praise teachers and our school for the technology inclusion experiences.

Under the Conditions heading in my "To Be" diagram in Appendix B, I listed four bullets they are:

- Plan and schedule time for training
- Development of a technology committee to recommend purchase of school technology and upgrade recommendations
- Diagnostic on bandwidth use and support radio/hub installation
- Increase communications between district and school technology personnel

Training time. The conditions section of my "To Be" diagram began with the need to schedule time for training. There are specific teacher union regulations that prohibit an administrator from calling a time for training. We have specific trainings on Wednesdays of each week but most of the Wednesdays were assigned to district professional development, individual classroom, core curriculum team meetings, and grade level meetings prescribed by the district and approved by the union. We therefore asked the leadership team for another weekday in which we could learning needs and train the teachers on the use of new APPS and programs.

Development of a Technology Committee. We had teachers volunteer to become eSTEAM Academy teachers so it was easier to have these teachers become the school technology committee. They used technology the most and were approached by their peers if they needed help with equipment or implementation. This was a very natural fit and has worked well during the first year's implementation. The technology committee recommends and approves all technology purchases and upgrades and presents the recommendations to the principal for approval.

Diagnostics. Teachers report lag times in service to administration and we request the district to perform a diagnostic on our server. This diagnostic process assesses the need for new enhancements or "Boosts" in the form of switches and radios to better receive a wireless signal. Our most recent diagnostic indicated we needed to upgrade our server, so the district has plans on doing this during the summer of 2015-2016 school year for more accurate service.

Increase in district communications. I have received emails from three other middle schools on how to implement BYOD at their schools. I have shared all of our information and these middle schools will pilot these new BYOD programs during the 2015-2016 school year. We also have also offered to host a "Cloud Walking" session to district teachers so they can learn how to use the cloud storage for student collaboration, assignments and teacher lesson posts. The district has accepted our offer and we will be hosting these sessions at our school to better our district teachers' understanding on using technology inclusion. We are currently planning on implementing some of the google classroom materials but the Google classroom materials do not come out until August, just before the beginning of school. Our district has felt our BYOD program has become a tremendous success, which was substantiated during my interview with the secondary director of education. The district technology director chose to place his children at our school due to the learning opportunities we offer to support our students in growing and achieving. These relationships have increased our communications between our school and district and we have earned the reputation as a technologically savvy school.

SECTION SEVEN: STRATEGIES AND ACTIONS FOR CHANGE

Strategies and actions that I have focused on are my research questions that are the main focus of the combination of my "As Is" (Appendix A) and my "Two Be" (Appendix B) diagrams. Change has occurred from my focusing on these questions and keeping them as a visionary map for planning. My first question was:

> 1-What effect might the institution and use of a BYOD – technology immersed program for the selected students have on their achievement grades, compared to other students who are not involved in a technology immersed classroom, and therefore do not use technology in their classrooms to the same extent as measured by the results of the Benchmark Assessment and State Achievement Test?

Unfortunately the scores have not been released on the State Achievement test and there was only one benchmark assessment test given during the 2014-2015 school year. While the assessment scores showed promise (Table 30), the State scores remain to be compared. There will be no student to student growth comparison available due to this being an implementation year for our State test. When the scores are released I would only be able to compare class average to class average to see if the eSTEAM Academy members had a significant difference in scores.

Question number two:

> 2. What do the participants (teachers) who are involved in a BYOD – technology immersed program at one middle school report as working well in the program?

As gathered through my interview process, 45% of the teachers felt that students' independence in created projects and experiences to develop skills was working

extremely well. Also, meeting what students will need for their futures. 36% of the teachers felt that the student engagement and skills in independent and collaboration had increased. There was a significant difference between the teachers' eSTEAM classes that held technology inclusion as compared to the same instructors' traditional classes. Teacher (K) reported that he would never return to traditional teaching, he felt this program encouraged his eSTEAM students to collaborate more and their final projects were of higher caliber in comparison to his traditional classes. I have encouraged Teacher K to take on a leadership role and in the future; he will have opportunities to offer district training sessions to support expanding the technology immersion curriculum process.

Question number Three:

3. What do the participants (teachers) who are involved in a BYOD – technology immersed program at one middle school report as not working well in the program?

One of the biggest challenges in the program was having the time to trouble shoot issues and for teachers to collaborate my survey indicated that 44% of the participants felt this was the greatest barrier. A close second at 33% was students being given the opportunity to use technology consistently. Sometimes the system would not run quick enough or some students had damaged devices and needed to borrow a device while theirs was in repair. The availability of devices was a challenge even with BYOD. Due to our district's recent financial struggles there has been no money available for enhancing or increasing technology on campus. This year it has been proposed by our district that we are going to receive 300 computers to help us with technology inclusion. I plan on pursuing grant funds and I plan on asking our parent teacher organization (PTO) to have a

fundraiser for the purpose of purchasing devices and needed software and support equipment.

4. What suggestions do the participants (teachers) who are involved in a BYOD– technology immersed program at one middle school report as suggestions for improving the BYOD– technology immersed program?

During our eSTEAM technology committee meetings we have discussed suggestions for improvement. During the 2015-2016 school year all but one of the teachers that were eSTEAM academy teachers were new to the program and five of the twelve core curriculum teachers were new to the teaching field. This caused a few challenges in not having the ability to develop curriculum and implementation during the summer months and the new teachers' lack of experience in classroom management and in standards alignment. This year we have more teachers coming on board and have focused on trying to include mathematics in the mix of core instructors. The math teachers will focus on the uses of excel and include this in standard in their math curriculum. Based on the realization there was no technology curriculum map or division of curriculum standards, we have met to develop a map and time-line for eSTEAM Academy instructors to focus on. The map has divided the technology standards up between the core instructors so the inclusion of the industry certification standards is manageable. Teacher K, who has taken on a technology inclusion leadership role often explains to his peers, "You do not have to start all over, this is a program that gets students engaged. You save so much time, for the students master the standard the first time with the imbedded use of technology. They learn to unpack and manipulate each

standard for greatest level of understanding. You save time from not having to remediate."

The biggest suggestion that came from the eSTEAM Academy was to give teachers more time by dedicating a week day morning for collaboration opportunities. The principal and school leadership committee supported this idea and parent and student support conferences will be limited to three days a week. One day a week was already mandated by the district for district planning.

By working as a team and supporting ideas and problem solving challenges we were able to continuously assess our program for improvement. As a school-site administrator, I am also interested in other practitioner issues and questions related to the implementation of this new program at our school, such as:

5. What implications for district-wide application of a BYOD– technology immersed program are revealed in the study of this BYOD– technology immersed program at one middle school?

This answer came this summer when three middle schools emailed me on how to implement a BYOD program at their school. They were interested in beginning to include technology into their students' curriculum. Each school may have a different plan based on the individual challenges, but to see this program begin to unfold district-wide was immensely rewarding. We made a difference to our school based students and now we are making a difference to other students across the district.

6. How will students who cannot afford technology, compete academically with students who can?

I was very concerned on being able to support students who could not afford a device. Would they be held back from not having the ability to work with technology as often as students whose parents could afford devices? The answer to this challenge came in an unexpected way, the parents and community stepped up. At the beginning of each year I receive emails from parents offering to help students who may need financial support. They purchase devices for students and make sure all students who have the desire to learn receive the tools to accomplish this desire. Some of these supporters had children who had already left the eSTEAM Academy. They were so amazed at their student's growth they felt they needed to pass on this experience. It was miraculous and filled me with hope as parents again and again offered support. I also have several parents that work in technology fields and they donate materials and time to enhance our students' learning. This may not be a forever solution, so we are looking at inexpensive devices they can be purchased so more students have the ability to have access to individual technology. We are researching grants and reviewing fund raiser opportunities to make sure we leave no student without the tools needed for success.

7. Was there a cost savings for the school (and eventually for the District) in using BYOD?

Yes, the district no longer has to purchase, repair, upgrade or replace devices and this is a huge savings in time, equipment and manpower. The savings for my school came in the printing need reduction. One of my instructors reported to me that he cut his printing costs by 2/3. He uses his overhead and computer more often and has no need to

print out worksheets. He posts all of his assignments to the cloud through Google Docs so no assignment is ever lost or not received for students can access this information 24 hours a day. He also communicates to parents weekly so they understand assignments in case their student is absent or needs greater support. This was a huge time saver for him, for the entire school year no parent requested a teacher meeting - for they regularly were in contact with the teacher.

8. How many participating academy students will successfully pass the Industrial Certification Test?

With the addition of three grades to the eSTEAM Academy it was difficult to focus on multiple teachers in three grade levels. However, we did manage to have 26 out of 44 sixth graders pass (59%) the industrial certification in Certiport's Internet and Computing Core Certification IC3 (Table 31). We had 12 out of 32 eighth graders (38%) pass the IC3 test and five out of fifty-six 8th graders passed Adobe CS6 Photoshop. This was more than I expected due to the late start of the program being purchased in January and tested in May and June. I was very pleased with these results and I look forward to seeing the improvements as we begin next year. One of the challenges we discovered was that Certiport had two versions of the IC3 certification. One of the versions was for Apple users and the other for PC users. We had not been informed about this, but discovered it on our own. At the beginning of next year the seventh graders will begin the year by taking the Certiport test, for while they knew the material last year they did not know how to manipulate the technology. Our future plan is to give the IC3 test after a short review.

Using strategies and actions based upon my research included best practices to reach the overall goal of developing student skills as 21st century learners. In using the four C's of Context, Culture, Conditions and Competencies I was able to develop a strategy plan for implementing this change by focusing on professional development, leadership and communications . Wagner et al. (2006)"Your system, any system, is perfectly designed to produce the results you're getting" (p. 106). The actions developed within my system helped the change plan meet success. All of these strategies and actions were placed in Appendix C, which gives a charted view of planning for change.

Under the heading of "Context" I used professional development to support teachers in training opportunities to learn new technology uses and applications. I also developed trainings to help teachers understand industry certification standards. These trainings helped to support a smooth transition of technology inclusion within the classrooms. Teachers talked about programs they were interested in learning and I would find trainers, either amongst the staff, students or I would reach out to the district for trainers, to make sure the teachers were supported in implementing new technologies.

As the leader it was important to develop these trainings and to monitor funds to make sure that the teachers had the equipment and material for successful technology implementation. Some of this might include example items such as video cameras and green screens (a screen that is used as a background in order to electronically superimpose any electronic background) to APPS or programs. A leader helps to organize the professional development opportunities and seek funding sources for equipment needs.

Communications between school and district is essentially important when using school funds to make purchases. Sometimes funding may come from the district and sometimes funding may come from school based internal funding sources. Communication with teachers on specific needs helps the change move forward with lessening the stress of material needs and making a plan for these needs to be met.

To develop the culture heading, I feel it is essentially important to eliminate the sense of fear that sometimes grows out of the unknown. When teachers first began to explore the inclusion of technology they knew little about how to develop a blended model of teacher and technology. Teachers did not want their classes to grow into a technology class. Teachers wanted to use technology to help students grow in learning by being able to research and develop project based ideas. Soon teachers found that students could create short films and slide shows as well as on-line posters that were often interactive. The more the teacher allowed students to explore, the more the students engaged in learning. Teachers had to alleviate the fear that they would not be experts in all uses, but remain open to allow students to develop uses based on their curiosity and willingness to explore new technology forms.

To support teachers in trying new technology, I created a teacher leadership group to help have a forum for teachers to problem solve challenges. One of my academy teachers formed a student leadership group. I provided these student leaders with the opportunity to support teachers, parents and community members with technology assistance. The learning that developed from these leadership opportunities was remarkable and I believe all participants benefited from the culture that developed around the interactions between these groups.

Communications were essential in establishing this cultural community. I arranged for times and a location for teachers to be able to meet. As the leader, I created agendas for the meeting and would send the agendas out for additions from the teacher members. The lead teacher held the student leadership meetings and I would be invited to attend if there was an agenda item needing my assistance. I also would ask the student leaders for help in providing meetings for parents and community members as well as assisting teachers who were trying new technology applications. Making sure these meetings and opportunities were communicated between all stakeholders was essential.

The conditions for success was to help teachers to be open to professional development from each other. I was able to support teachers visiting other classrooms to see how teachers were growing technology skills within their classrooms. Often these visits would assist with the pedagogy needed within a blended model. One example was students being off task while using technology. Teachers would walk about class, but students could quickly move from one screen to another without the teacher seeing the off task behavior. Through the open conversations teachers' problem solved viewing the "history" of the students' uses during class. Student sharing the history, when asked, became a part of the discipline process. A student refusing to share their technology history would receive a punitive measure. The "history" on the computer would show what the students had been viewing thereby being able to monitor proper use.

As the leader I was responsible for planning time for meetings and trainings. I would provide the materials, agenda and location for meetings and trainings often asking stakeholders for suggestions to establish conditions of inclusion in the planning process. I also reviewed the need for technology upgrades and made technology purchase recommendations. I would present these needs to the technology leadership committee so we could make these recommendations as a team and plan on effective purchases with little waste of funds.

Communications were essential in establishing a condition for success. I used technology messages in the form of emails and calendar reminder notifications if I was communicating with the district or faculty. For student communications, I would ask the teachers to remind students. To communicate with families, I would send out a phone reminder and post the meeting on the school website.

To make sure the material conditions were met such as bandwidth and internet connection, I would send messages to the district if internet signals became weak or stopped all together. The district would then send out a technology specialist and check for bandwidth holes. If a hole were established the district would install a radio or hub to enhance signal fidelity. These communications are essential for the conditions to remain harmonious.

In the area of competencies, I used surveys from the staff to develop professional trainings. The new staff members had to be trained on how to implement BYOD and technology use within their classroom. Veteran teachers' needs developed to cloud use and cloud storage as well as advanced uses in Google classroom applications. These developments bettered technology inclusion and enhanced the ability for students to safely collaborate outside of the protected school guest network.

While students were on campus, it was important for them to use the school's guest network for security purposes. The guest network was protected by all of the districts network protection systems. Under the guest network students' devices were also protected from virus infiltration as well as the school's systems. The guest network created a safe atmosphere competency for students to collaborate, and explore facts on the internet. As leaders in their classroom, teachers had to know when a student was on the guest network. Training was developed to teach the pedagogy of seeking the school

guest network icon that would be present whenever anyone was on the guest network. This icon was easy to locate and needed to be monitored if technology was in use.

The process of downloading APPS and programs became a communication issue. If these downloads occurred at school, often the bandwidth would not support multiple users implementing a download process. We problem solved that downloads needed to happen at students' homes whenever possible. If it were not possible to implement a download at home, then a schedule had to be established in order for the download process to work. Sometimes I had to communicate with the district to purchase systems such as Certiport, which was needed for industry certification testing. Some systems required multiple phone calls and installations to be able to support the purchased program. If a technology specialist were not available on the school site, then I had to call the district and request that a technology specialist be scheduled to make sure this process occurred. Communications with teachers and students was essential in order to hear the challenges and move forward with solutions. Frustrations often occurred while implementing these new programs. A need for competency of flexible planning from the teacher was essential for success.

The goal of this change leadership project was to prepare students as 21st century learners. The planning was to needed to establish a blended model of teacher and technology. Through my observations, the blended model provided students with an engaging, collaborative interactive learning forum. This learning forum provides an opportunity to grow what Wagner et al. (2006) calls for as a need for a new kind of leader, "We need leaders whose expertise is more invested in helping a group create the shared knowledge necessary for sustained improvement than in being the certain source

of the answers and solutions" (p. 209). I believe this preparation will include a change in the ways teachers as classroom leaders teach. Teachers do not have the knowledge that is available on the internet. Teachers will need to become facilitators of knowledge continuously encouraging their students to seek new methods in learning and presenting.

Conclusion

The success of a BYOD and technology inclusion model is built on the foundation of the right leaders coming together under a common goal with a focus on the enhancement of student learning. These leaders should represent all of the stakeholder groups. Wagner, et al. (2006) refer to a key principle of engagement as, "the opportunity to consider. The question cited as fundamental to the opportunity to consider is 'where do we go from here?" (p. 220). We grew our success by continuously asking, "Where do we go from here?" During the summer, we met to discuss holding student leadership training sessions to further student growth as potential technology support providers. If a teacher gets into a situation in which they are overwhelmed by student questions and issues with technology in their classroom, one avenue for support is having students trained in the role of technology support.

We became a technology learning community. We shared the vision and allowed time and space for mistakes and garnered wonderful successes. We found that by continually asking and sharing the "What next? How do we solve this? Where do we go from here?" type of questions, we were able to engage buy-in and a culture of creativity, which has greatly reinforced the support of the program's growth leading to the ultimate goal of a flourishing model of enriched technologically infused educational programming.

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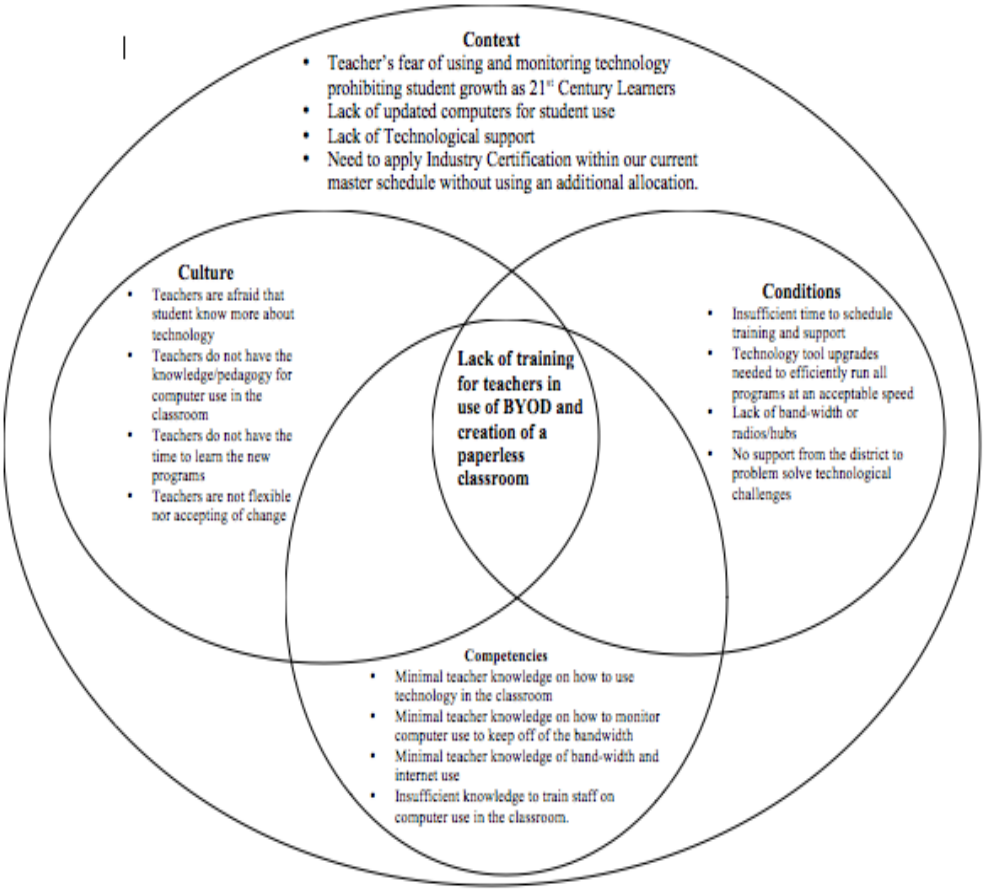
Appendix A

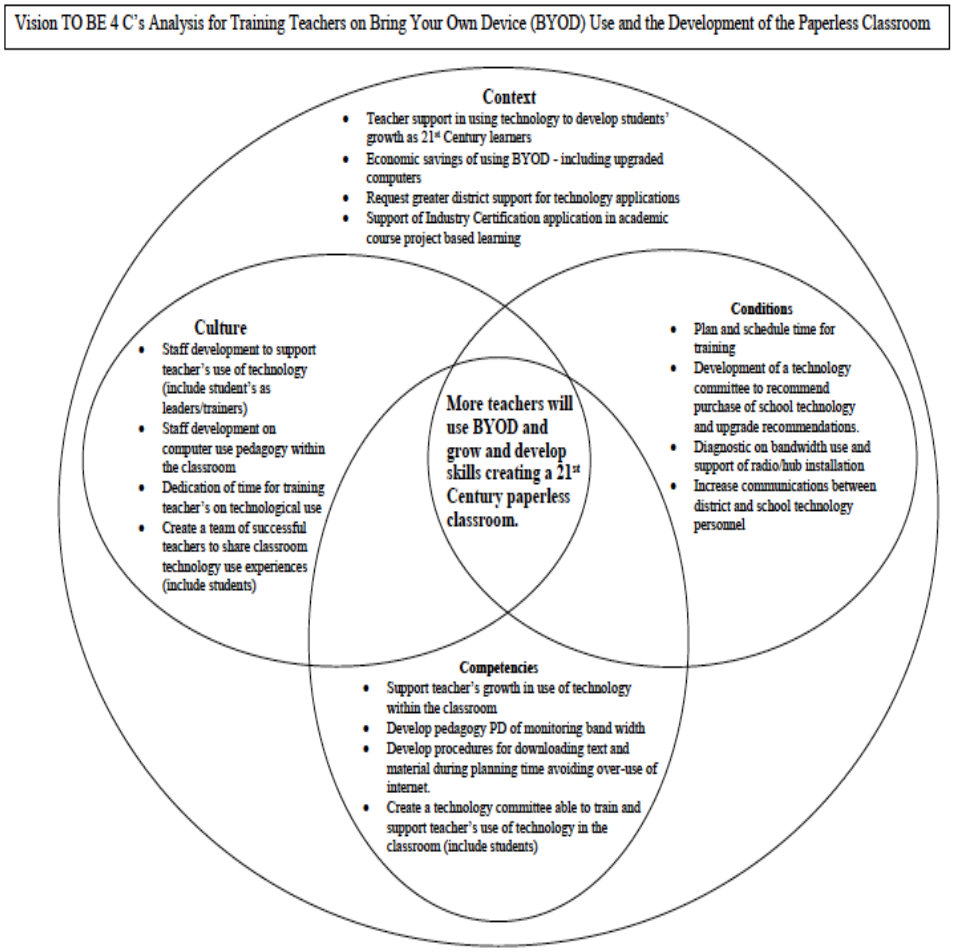
The 4 C's (As-Is) Analysis

Baseline AS IS 4 C's Analysis for Training Teachers on Bring Your Own Device (BYOD) Use and the Development of the Paperless Classroom



Appendix B

A Vision of Success (To-Be)



Appendix C

Strategies and Actions Chart

	STRATEGIES	ACTIONS
CONTEXT		
	Professional Development	Teacher support in providing training for teachers to learn new technology uses and applications.
		Training in industry certification standards
	Leadership	Economic savings and redistribution of funds.
	Communication	Request district support for technology applications.
CULTURE		
	Professional Development	Alleviating the fears of teachers by providing learning opportunities.
	Leadership	Create a student and teacher leadership team to support new technology inclusion.
		Finding time during the day to support teachers and give them opportunities to explore, share, train and discover new technology opportunities.
	Communication	Teachers need an opportunity to talk about what works in class and what does not work well. "Share Time" or what we call "Appy Hour".
CONDITIONS		
	Professional Development	Encouraging teachers to visit one another's classes to see how another teacher handles pedagogy of technology implementation.
	Leadership	Plan and schedule time for sharing and training
		Review technology upgrades and purchase recommendations.
		Completed diagnostic of bandwidth needs.

	Communication	Inform district of technology needs and upgrades for purchasing purposes.
		Inform district of bandwidth requirements.
		Increase talks between the district technology and purchasing departments.
COMPETENCIES		
	Professional Development	Assure training that is needed gained through survey process.
	Leadership	Develop pedagogy for bandwidth monitoring to make sure students are on guest network.
		Establish a technology committee and student leadership committee to better decide technology needs and problem solve challenges.
	Communication	Communicate procedures for downloading APPS to slow down bandwidth use.
		Talk about challenges and work out solutions within the technology committee and student leadership committee.
Goals	To use all staff development, leadership and communication to develop students as 21st Century learners.	Lead students into the unknown future as 21st century learners.
		Use a blended model of teacher and technology.
		Create a "paperless" classroom using technology to enhance students' learning.

Appendix D

Senate Bill 850 Excerpts (6/20/2014)

Career and Professional Education (CAPE)

- Provides elementary and middle school students, including students with disabilities, options to earn CAPE Digital Tool certificates and CAPE industry certifications.
- Provides high school students a variety of options to earn CAPE industry certifications, which may articulate for college credit.
- Requires identification of CAPE Digital Tool certificates and CAPE industry certifications on the CAPE Industry Certification Funding List.
- Requires the Articulation Coordinating Committee to review the statewide articulation agreement proposals for industry certifications and make recommendations to the State Board of Education (SBE) for approval.
- Requires district school boards to notify the parent of a student who earns an industry certification that articulates for postsecondary credit:
    - The estimated cost savings to the parent regarding the student's attainment of the industry certification before graduation from high school compared to the cost of acquiring the industry certification after high school graduation.
    - Additional industry certifications available to the student.
- Provides bonus funding to school districts for each CAPE Digital Tool certificate and CAPE industry certification earned by elementary, middle, and high school students.
- Provides bonus funding for teachers who teach a course that leads to the attainment of a CAPE industry certification.
- Requires weighting a grade in a course that leads to an industry certification the same as a grade in an Honors course for the purposes of calculating grade point average.
- Eliminates un-implemented CAPE provisions regarding Florida Cybersecurity and Florida Digital Arts recognitions.

House Bill 7031 (Excerpts) Ch. 2014-39

(pp. 36 & 37)

Section 46. Subsection (2) of section 1003.4935, Florida Statutes, is amended to read:
1003.4935 Middle grades career and professional academy courses and career-themed courses.
—
(2) Each middle grades career and professional academy or career-themed course must be aligned with at least one high school career and professional academy or career-themed course offered in the district and maintain partnerships with local

business and industry and economic development boards. Middle grades career and professional academies and career-themed courses must:

(a) Lead to careers in occupations designated as high-skill, high-wage, and high-demand in the Industry Certification Funding List approved under rules adopted by the State Board of Education;

(b) Integrate content from core subject areas;

(c) Integrate career and professional academy or career-themed course content with intensive reading, English Language Arts, and mathematics pursuant to s. ss. 1003.428 and 1003.4282;

(d) Coordinate with high schools to maximize opportunities for middle grades students to earn high school credit;

(e) Provide access to virtual instruction courses provided by virtual education providers legislatively authorized to provide part-time instruction to middle grades students. The virtual instruction courses must be aligned to state curriculum standards for middle grades career and professional

CODING: Words stricken are deletions; words underlined are additions. Academy courses or career-themed courses, with priority given to students who have required course deficits;

(f) Provide instruction from highly skilled professionals who hold industry certificates in the career area in which they teach;

(g) Offer externships; and

(h) Provide personalized student advisement that includes a parent-participation component.

(p. 57)

1008.25 Public school student progression; remedial instruction; reporting requirements.

—

(2) COMPREHENSIVE STUDENT PROGRESSION PLAN.

—

Each district school board shall establish a comprehensive plan for student progression which must:

(h) Provide instructional sequences by which students in kindergarten through high school may attain progressively higher levels of skill in the use of digital tools and applications. The instructional sequences must include participation in curricular and instructional options and the demonstration of competence of standards required pursuant to ss. 1003.41 and 1003.4203 through attainment of industry certifications and other means of demonstrating credit requirements identified under ss. 1002.3105, 1003.4203, 1003.428, and 1003.4282.

(Page 12 &13) Chapter No. 2014-184

(3)(4)
CAPE DIGITAL TOOL CERTIFICATES.
—
Subject to available funding, by December 1, 2013, The department shall identify, by June 15 of each year, CAPE Digital Tool certificates that contract with one or more technology companies that have approved industry certifications identified on the Industry Certification Funding List or the Postsecondary Industry Certification Funding List, pursuant to s. 1003.492 or s. 1008.44, to develop a Florida Digital Tools Certificate to indicate a student's digital skills. The department shall notify each school district when the certificates are certificate is developed and available. The certificates certificate shall be made available to all public elementary and middle grades students at no cost to the districts or charter schools.

(a) Targeted skills to be mastered for the certificate include digital skills that are necessary to the student's academic work and skills the student may need in future employment. The skills must include, but are not limited to, word processing; spreadsheets;, spreadsheet display, and creation of presentations, including sound, motion, and color presentations; digital arts; cybersecurity; and coding including sound, text, and graphic presentations, consistent with CAPE industry certifications that are listed on the CAPE Industry Certification Funding List, pursuant to ss. 1003.492 and 1008.44. CAPE Digital Tool certificates earned by students are eligible for additional full-time equivalent membership pursuant to s. 1011.62(1)(o)1.a s. 1003.492.
(b) A technology company that provides the certificate must provide open access to materials for teaching and assessing the skills necessary to earn the certificate. The school district shall notify each middle school advisory council of the methods of delivery of the open-access content and assessments for the certificates certificate. If there is no middle school advisory council, notification must be provided to the district advisory council.
(c) The Legislature intends that by July 1, 2018, on an annual basis, at least 75 percent of public middle grades students earn at least one CAPE Digital Tool certificate a Florida Digital Tools Certificate.

(4) CAPE INDUSTRY CERTIFICATIONS.
—

(a) CAPE industry certifications, issued to middle school and high school students, which do not articulate for college credit, are eligible for additional full-time equivalent membership pursuant to s. 1011.62(1)(o)1.b.
(b) CAPE industry certifications, issued to high school students, which articulate for college credit, are eligible for additional full-time equivalent membership pursuant to s. 1011.62(1)(o)1.b.

(5) CAPE INNOVATION AND CAPE ACCELERATION.
—

(a) CAPE Innovation.
—

Up to five courses annually approved by the commissioner that combine academic and career content, and performance outcome expectations that, if achieved by a student, shall articulate for college credit and be eligible for additional full-time equivalent membership pursuant to s. 1011.62(1)(o)1.c. Such approved courses must incorporate at least two third-party assessments that, if successfully completed by a student, shall articulate for college credit. At least one of the two third- party assessments must be associated with an industry certification that is identified on the CAPE Industry Certification Funding List. Each course that is
Code Directory as a CAPE Innovation Course.

(b) CAPE Acceleration.
—

Industry certifications, annually approved by the commissioner, that articulate for 15 or more college credit hours and, if successfully completed, shall be eligible for additional full-time equivalent membership pursuant to s. 1011.62(1)(o)1.d. Each approved industry certification must be specifically identified in the CAPE Industry Certification Funding List as a CAPE Acceleration Industry Certification.

(6) GRADE POINT AVERAGE CALCULATION.
—

For purposes of calculating grade point average, a grade in a course that is level 3 or above and leads to an industry certification must be weighted the same as a grade in an Honors course.

Appendix E

BYOD and Technology Expectation and Usage Policy

As new technologies continue to change the world in which we live, they also provide many new and positive educational benefits for classroom instruction. Bring Your Own Device (BYOD) encourages students to bring their own technology devices to school to assist their learning experiences. This document provides the expectations of Nolan in regards to technology use at school. Please note that students who cannot bring in outside technology will be able to access and utilize the school's equipment. **No student will be left out of our instruction.**

BYOD EXPECTATIONS:

Internet:

The only internet permitted is our Nolan guest network only, unless otherwise directed by the teacher. **Hot spots or any other internet access other than MaJolu Guest are NOT permitted to be used at any time**. Nolan's network filters will be applied to one's connection to the internet and any attempt to bypass them or infect the network program designed to damage, alter, destroy, or provide access (hacking) to unauthorized data or information is in violation of the Acceptable Use Policy and will result in disciplinary actions. *All technology use is at the discretion of the administrator or teacher.*

Security and Damages:

Responsibility to keep the device secure rests with the individual owner. County School District is not liable for any device stolen or damaged on campus. If a device is stolen or damaged, it will be handled through the administrative office similar to other personal artifacts that are impacted in similar situations. It is recommended that skins (decals) and other custom touches are used to physically identify your device from others. Additionally, protective cases and security codes are encouraged. Students should bring their devices full charged to school each day, charging a device at school is limited and is

the full responsibility of the student. The student takes full responsibility for his or her technology device. **The school is not responsible for the security of student-owned technology.**

BYOD TECHNOLOGY AGREEMENT:

The use of technology to provide educational material is not a necessity, but a privilege. A student does not have the right to use his or her laptop, cell phone or other electronic device while at school except in the approved class. When abused, privileges will be taken away. When respected, they will benefit the learning environment as a whole.

The technology must be in silent mode while on school campuses and while riding school buses. Devices may not be used in the bathrooms at any time. The technology may not be used to cheat on assignments or tests, or for non-instructional purposes. The student accesses only files on the computer or internet sites which are relevant to the classroom curriculum. Printing from personal devices is not possible at school. The student complies with teachers' request to shut down the computer or close the screen. The school district has the right to collect and examine any device that is suspected of causing problems or was the source of an attack or virus infection. **No texting, No Photos/Videos, and No Social Media** unless approved by the teacher for instruction.

STUDENT AGREEMENT:

I understand that any of the above violations are unethical and may result in the loss of my network and/or laptop privileges as well as other disciplinary action.

PARENT AGREEMENT:

My student will be subject to discipline for texting during the school day without teacher permission. I also understand that if my child is sick, he/she MUST go to the clinic to call home.

As the parent / guardian of this student, I understand that although my student’s teacher will encourage and enforce proper device usage of technology, however, it is my

responsibility to check time stamps and social media usage, to assure that my student is correctly using their equipment and time in school. Also I understand that calling or texting my student during school hours is not allowed**.**

OPT OUT PROCEDURE/OPTION:

In order to opt out of Nolan's BYOD and Technology code of conduct and usage contract please send in a letter to Mrs. Cornwell within the first 14 days of school. Please know that opting out means your student will not be able to use their own devices at school, nor will they be able to use Nolan's equipment. Nolan's technology contract pertains to both BYOD and school owned devices.

3/5/15

Appendix F

BYOD Contract

The BYOD contract is now included in the Student Handbook. Please read carefully!

BYOD INFORMATION AND REQUIREMENTS:

What is BYOD / BYOT?

Bring Your Own Device, also known as BYOT (Technology) is the practice of allowing students to bring technology devices from home to use in the classroom, at the discretion of the teacher. These devices include, but are not limited to, cell phones, smart phones, tablet computers, laptop computers, netbooks, e-readers, mp3 players, and whatever other new technologies may come along.

Why BYOD?

There are several reasons for schools to implement BYOD:

1. It creates an opportunity for new and engaging methods of teaching and learning in the classroom.
2. It helps prepare students to enter the 21st Century workplace, which is becoming increasingly Internet and device centric.
3. It gives students the opportunity to access tools they are using outside of school to accomplish academic tasks and to learn new productivity tools of which they may not be aware.
4. It means students will need minimal training in the use of the devices and meets them at a basic comfort level.
5. It opens the possibility for discussions of digital citizenship, online etiquette, or "netiquette", and digital information literacy.

Are all teachers using BYOD?

All teachers have the opportunity to participate in training so they may learn classroom management and instructional practices that will enable safe and efficient use of devices in their classrooms. Students in the classes of those teachers will be granted access to the school's wireless network and will have the opportunity to use their devices in class for educational purposes at the discretion of their teachers.

Why do this?

We are giving limited rollout of our guest network and BYOD to give all parties involved time to assess, adjust, and learn before we open BYOD school-wide. The wireless infrastructure also can be assessed to determine if it is optimized for how teachers and students will use it in class.

What will happen if my child is in a BYOD class?

You and your child will be required to sign new copies of the Nolan BYOD Contract and MaJolu County Acceptable Use Policy before your child will be allowed to join the network and access the Internet on his or her own device. After that, the use of devices in the classroom is at the discretion of the teacher.

FREQUENTLY ASKED QUESTIONS:

Will my child be required to bring a device to class if he or she is in the program?

No. Bringing and using a device is completely optional.

Who is responsible for charging, securing, and maintaining students' devices?

Students and families are responsible for the charging, maintenance, and security of their own devices. The Technology Department is not able to provide technical support for student devices. It is recommended that students in BYOD classes bring their devices to school with batteries fully charged and a charger. Teachers are not responsible for charging, servicing, or maintaining student devices. If a

student's device becomes disabled during school, the student should bring the device home for troubleshooting.

Are there security issues?

All users are connected to the district's guest network, which has filtered Internet access. Students will not be able to access printers, network drives, or student information systems. Basically, they will have the same abilities they would if they connected to the Internet from a coffee shop or hotel.

Are websites filtered?

Yes. The safety of students online is of utmost importance to us. Websites are filtered the same as if students were on a MaJolu County computer, and each teacher is expected to monitor students in their classrooms.

Does my child need to have the latest and greatest technology device to connect?

No. The latest technology is not required. There are many devices that will connect. Just about any laptop will work, as well as current tablets and smartphones from well-known companies. To get technical, the device needs to be able to support 802.1x wireless connectivity.

What devices do you recommend?

At this time, we are making no device recommendations. However, Nolan Middle School supports Apple OSX.5 and up, Windows 8 and up, as well as iOS 5 and up.

Appendix G

IRRB Research Questions

Primary Research Questions:

1. What effect might the institution and use of a BYOD – technology immersed program for the selected students have on their achievement grades, compared to other students who are not involved in a technology immersed classroom, and therefore do not use technology in their classrooms to the same extent as measured by the results of the Benchmark Assessment and State Achievement Test?

2. What do the participants (teachers) who are involved in a BYOD – technology immersed program at one middle school report as working well in the program?

3. What do the participants (teachers) who are involved in a BYOD – technology immersed program at one middle school report as not working well in the program?

4. What suggestions do the participants (teachers) who are involved in a BYOD– technology immersed program at one middle school report as suggestions for improving the BYOD – technology immersed program?

Secondary Research Questions:

As a school-site administrator, I am also interested in other practitioner issues and questions related to the implementation of this new program at our school, such as:

5. What implications for district-wide application of a BYOD– technology immersed program are revealed in the study of this BYOD– technology immersed program at one middle school?

6. How will students who cannot afford technology, compete academically with students who can?

7. Is there a cost savings for the school (and eventually for the District) in using BYOD?

8. How many participating academy students will successfully pass the Industrial Certification Test?

Appendix H

Teacher Survey

TEACHER SURVEY MONKEY

Total Number of Years Teaching: _____

Grade(s) Currently Teaching: 6 7 8

Subject(s) Currently Teaching (please list):

_____

_____

Please Circle Your Demographic Memberships

Male or Female

White Black Hispanic Asian Other: _____

I use technology at home:

Yes No

I use technology at work:

Yes No

Please list the programs and applications you use the most:

My ranking for my technology in the classroom performance level:

Expert Advanced Moderate Beginning

Please fill in the blank for each of the following questions; you may use the back of this paper if you need additional space.

1. What is your greatest concern about using technology in the classroom and why?

_____

_____

2. What do you think is needed to help you develop as a teacher using technology in the classroom?

_____

_____

3. When do you observe students using technology most for educational purposes?

_____

_____

4. What is the greatest student misuse of technology?

_____

_____

5. What classroom management skills do you think need to be implemented to monitor technology use in your classroom?

_____

_____

6. In order to develop your skills in use of technology within your classroom what type(s) of trainings do you believe may be of greatest assistance with your current application use?

_____

_____

7. What would you suggest to help improve technology use in your classroom?

_____

_____

8. What would like to see your student(s) do more of in the BYOD technology enhanced Science class?

_____

_____

9. What would you expect your student(s) to do less of in the BYOD enhanced Science class?

_____

_____

10. What is your greatest concern about using technology in your classroom?

_____

_____

11. What was your greatest experience with using or seeing technology use within your classroom or while at school?

_____

_____

12. My favorite application/program to use is?

_____

13. My students' favorite application/program to use is?

_____

14. What is the greatest barrier to using technology within your classroom?

_____

_____.

Please circle the choice that best indicates your opinion or experience:

15. If my student(s) were given a choice of the format through which to complete a project in class, the majority of my students would most likely choose (Select One):

An Art Project (Poster, Game Board, or other)	A Technology Project (iMovie, PPT, or Weebly)	A Speech or Presentation (Book report or subject report)

16. My student(s) have indicated to me that they like using technology in class:

Always Usually Sometimes Never

17. What percentage of your students own and use a device within your classroom?

100%-90% 89%-70% 69%-50% 50%- Below

18. I use technology in class almost every day:

Always Usually Sometimes Never

Appendix I

Teacher Interview Questions

1. What do you think are the biggest advantages of using technology immersion within your classroom?
2. What do you think are the biggest challenges of using technology immersion within your classroom?
3. How will your students understand the responsibilities that go with BYOD, how have you helped them understand those responsibilities within your classroom?
4. What have you used to grow digital citizenship understanding within your classroom?
5. With the implementation of BYOD last year, did you hear about any challenges while you were incorporating BYOD and technology immersion?
6. How did you support those students who couldn't afford devices and yet wanted to participate in the BYOD program within your classroom?
7. How do you think using technology in the classroom will impact your students' futures?
8. What did you hope to achieve by the blended model of incorporating the excel component of the industry certification within your classroom?
9. What area of professional development would you recommend in order for us to further the BYOD and ICM implementation?
10. Do you have any other thoughts or experiences from this year on BYOD that you would like to share with me?

Appendix J

Interim Director of Technology Interview Questions

1. In implementing BYOD within our district what do you see as some of the challenges?
2. What will our district need to focus on to be able to keep up with the growth in technology for 21st century learners?
3. What would be some suggestions/considerations for implementing technology and including industry certification standards/ strategies so we have consistency within individual schools in our district?
4. If you could see into the future what do you think is going to happen with technology in our State /Nation in the next 5 years? 10 years?
5. If you could begin again, with no financial limitations, what would you do to prepare our district for the 21st Century technological boom?
6. Do you feel placing in a guest network or other technological support in each school will provide students with filtration protection as long as the classroom teacher monitors it? If not, what might be another protection to prevent students using devices inappropriately?
7. What is being planned for in preparation for meeting the technology mandates that are being proposed by the State such as the Tech-Book initiative?
8. Is there a cost savings with using a BYOD program? What are some of the set up challenges on initiating a BYOD program or technology immersion within the classroom?
9. Do you have any other thoughts on the BYOD program that you wish to share with me?

Appendix K

PRINCIPAL INFORMED CONSENT

School Site Administrator Form: Consent to Conduct Research at the Site

You are being asked to consent to Nolan Middle School participating in a research study conducted by Tamara Cornwell, doctoral student at National Louis University, Tampa, Florida. The study is entitled: A Change Leadership Plan for Training Teachers on Bring Your Own Device Use and the Development of the Paperless Classroom. The purpose of the study is to investigate the issues involved with taking a Bring Your Own Device (BYOD) program to a larger scale thru incorporating immersion of technology in sixth, seventh and eighth grade classrooms.

The research will address the quantitative measure of student engagement as gathered through the classroom walk-through process and assessment results on quarter assessments (for spring 2015) and State Assessment Test (May, 2015). Results will be compared to a classroom using intermittent technology. Data will be gathered through a program anonymous survey, and via a program interview with the teachers implementing BYOD in an academy technology immersed classroom. Data will be gathered outside of instructional time. All data results will be shared with the district and a report of the results will be available by December 31, 2015. After gathering data I hope to purpose a program that will endeavor to assist both school and district on using a BYOD technology immersed program within the school setting and help deliver pedagogy strategies for staff development and implementation of technology immersion within the core classroom to support industry certification achievement. Observations will be completed during the normal school day. I would like to observe up to 24 teachers, twice, for 10 to 15 minutes each time to gather data on student engagement. During the walk through, I will concentrate on monitoring student response. The interviews will be =+++ during non-school hours and will be completed only on teachers who have signed a consent form.

By signing below, you are giving your consent for me to ask for voluntary participation from all participating teachers to participate in this research study. I will ask them to complete a survey and an interview and all responses should be based upon their experiences and opinions. All participation is voluntary; a participant may discontinue participation at any time. All identities will be confidential by the researcher and will not be attached to the data. Only the researcher will have access to all of the surveys and field notes, which I will keep in a locked file at my home. Participation in this study does not involve any physical or emotional risk beyond that of everyday life. While participants most likely will gain any direct benefit from taking part in this research study, the study may contribute to our better understanding of the implementation of Bring Your Own Device programs and the use of technology in the classroom. While the results of this study may be published or otherwise reported to scientific bodies, your identity, the identity of the school, nor the identity of the district will not be revealed. You may request a copy of the final report by emailing me at tcornwell@my.nl.edu

In the event you have questions or require additional information, you may contact the researcher: Tamara Cornwell, National-Louis doctoral student, phone: 941-812-2836; email: tcornwell@my.nl.edu; or mail, 5110 Eisenhower Blvd. #102 Tampa, FL 33634.

If you have any concerns of questions before or during participation, which you feel have not been addressed by the researcher, you may contact one or more of the following National Louis University representatives:
Dr. Carol Burg: email: cburg@nl.edu; phone: (813) 397-2109; or by mail: 5110 Eisenhower Blvd. #102 Tampa, FL 33634 OR EDL Program Chair, Dr. Norm Weston, email: NWeston@nl.edu OR NLU's Institutional Research Review Board, Dr. Shaunti Knauth, NLU IRRB Chair, shaunti.knauth@nl.edu; Phone: (224) 233-2328; Mail: National Louis University IRRB Board, 122 South Michigan Avenue, Chicago, IL 60603

_____
Principal Name (Please Print)

_____ _____
Principal Signature Date

_____
Researcher Name (Please Print)

_____ _____
Researcher Signature Date

Appendix L

INFORMED CONSENT

Survey: Adult Individual Participant

You are being asked to participate in a research study conducted by Tamara Cornwell, doctoral student at National Louis University, Tampa, Florida. The study is entitled: A Change Leadership Plan for Training Teachers on Bring Your Own Device Use and the Development of the Paperless Classroom. The purpose of the study is to evaluate the effectiveness of a Bring Your Own Device (BYOD) program to incorporate immersion of technology use within the 6th, 7th and 8th grade across multiple academic curriculums.

The research will address the quantitative measure of student engagement as gathered through the classroom walk-through process and quarterly assessments. The second quarter assessments will be given in January 2015. Results will be compared to a classroom using immersed technology as compared to a classroom using intermittent technology. Data will be gathered through an open-ended survey. After gathering data, I will endeavor to assist our school and district on using a BYOD program within the school setting and help deliver pedagogy strategies for staff development and implementation of technology immersion within the core classroom to support industry certification.

The participating teachers should expect to receive a survey monkey to be completed and returned using specific instructions as included. An Informed Consent form indicates that you understand the purpose of the survey and agree to participate in the survey. All information collected reflects your experience and opinion as a teacher.

By signing below, you are giving your consent to participate in this research study. You will complete a program survey and all responses should be based upon your experiences and opinions.

Your participation is voluntary and you may discontinue your participation at any time. Your identity will be confidential by the researcher and will not be attached to the data. Only the researcher will have access to all of the surveys and field notes, which I will keep in a locked file at my home. Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life. While you are likely to not have any direct benefit from being in this research study, your taking part in this study may contribute to our better understanding of implementing Bring Your Own Device programs and adding technology use into the everyday classroom to support industry certification achievement.

While the results of this study may be published or otherwise reported to scientific bodies, your identity will in no way be revealed. You may request a copy of the final report by emailing me at tcornwell@my.nl.edu.

In the event you have questions or require additional information, you may contact the researcher: Tamara Cornwell, National-Louis doctoral student, phone: 941-812-2836; email TamaraKCornwell@msn.com; 4950 W. Kennedy Blvd. #300 Tampa, FL 33609.

If you have any concerns of questions before or during participation, which have not been addressed by the researcher, you may contact one or more of the following National Louis University representatives:

Dr. Carol Burg: email: cburg@nl.edu; phone: (813) 397-2109; or by mail: 5110 Eisenhower Blvd. #102 Tampa, FL 33634

EDL Program Chair, Dr. Norm Weston, email: NWeston@nl.edu

NLU's Institutional Research Review Board, Dr. Shaunti Knauth, NLU IRRB Chair, shaunti.knauth@nl.edu; Phone: (224) 233-2328; Mail: National Louis University IRRB Board, 122 South Michigan Avenue, Chicago, IL 60603

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Teacher Name (Please Print)

_____ _____

Teacher Signature Date

_____

Researcher Name (Please Print)

_____ _____

Researcher Signature Date

Appendix M

INFORMED CONSENT TO CONDUCT INTERVIEW

Adult: Interview Participation

You are being asked to consent to participate in a research study conducted by Tamara Cornwell, doctoral student at National Louis University, Tampa, Florida. The study is entitled: A Change Leadership Plan for Training Teachers on Bring Your Own Device Use and the Development of Industrial Certification within the Middle School Classroom. The purpose of the study is to evaluate the effectiveness of a Bring Your Own Device (BYOD) program to incorporate immersion of technology use within sixth, seventh and eighth grade classrooms across all participating curriculum classes supporting student achievement of industry certification.

Interview participants will be asked to participate in two 30 to 45 minute interviews and sign an Informed Consent form indicating that they understand and agree to participate in the interview process. All information collected reflects their experience and opinion as a participant.

By signing below, you are giving your consent to participate in this research study. You will participate in two 30-45 minute interview. An interview will occur in March 2015 and all responses should be based upon your experiences and opinion. The interviews will be given after school hours and will not affect the scheduled academic day. The interview will be voice recorded and transcribed by the researcher. All interview tapes and transcripts will use a pseudonym to protect your anonymity, and will be kept in a locked cabinet at the researcher's home. Only the researcher will have access to this data.

Your participation is voluntary and you may discontinue your participation at any time. Your identity will be kept confidential by the researcher and will not be attached to the data. Only the researcher will have access to all of the surveys, interviews and field notes. Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life. While you are likely to not have any direct benefit from being in this research study, your taking part in this study may contribute to our better understanding of implementing Bring Your Own Device programs and adding technology use into the everyday core classroom to support student industry certification.

While the results of this study may be published or otherwise reported to scientific bodies, your identity will in no way be revealed. You may request a copy of the final report by emailing me at tcornwell@my.nl.edu

In the event you have questions or require additional information, you may contact the researcher: Tamara Cornwell, National-Louis doctoral student, phone: 941-812-2836; email TamaraKCornwell@msn.com; 5110 Eisenhower Blvd. #102 Tampa, FL 33634.

If you have any concerns of questions before or during participation, which you feel have not been addressed by the researcher, you may contact one or more of the following National Louis University representatives:

Dr. Carol Burg: email: cburg@nl.edu; phone: (813) 397-2109; or by mail: 5110 Eisenhower Blvd. #102 Tampa, FL 33634

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Teacher Name (Please Print)

_____ _____
Teacher Signature Date

_____
Researcher Name (Please Print)

_____ _____
Researcher Signature Date

Appendix N

INFORMED CONSENT TO CONDUCT INTERVIEW

Adult: Permission to Observe Classroom

You are being asked to consent to participate in a research study conducted by Tamara Cornwell, doctoral student at National Louis University, Tampa, Florida. The study is entitled: A Change Leadership Plan for Training Teachers on Bring Your Own Device Use and the Development of Industrial Certification within the Middle School Classroom. The purpose of the study is to evaluate the effectiveness of a Bring Your Own Device (BYOD) program to incorporate immersion of technology use within sixth, seventh and eighth grade classrooms across all participating curriculum classes supporting student achievement of industry certification.

Participants will be asked to participate in two 10 to 12 minute classroom observations and sign an Informed Consent form indicating that they understand and agree to participate in the observation process. All information collected reflects their experience and opinion as a participant.

By signing below, you are giving your consent to participate in this research study. You will participate in two 10-15 minute observations. Observations will occur between March and May 2015. I will be looking for indications that students are engaged in the lesson. The observations will be given during school hours but will not affect the scheduled academic day. The researcher will document the observations. All observations will use a pseudonym to protect your anonymity, and will be kept in a locked cabinet at the researcher's home. Only the researcher will have access to this data.

Your participation is voluntary and you may discontinue your participation at any time. Your identity will be kept confidential by the researcher and will not be attached to the data. Only the researcher will have access to all of the observations and field notes. Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life. While you are likely to not have any direct benefit from being in this research study, your taking part in this study may contribute to our better understanding of implementing Bring Your Own Device programs and adding technology use into the everyday core classroom to support student industry certification.

While the results of this study may be published or otherwise reported to scientific bodies, your identity will in no way be revealed. You may request a copy of the final report by emailing me at tcornwell@my.nl.edu.

In the event you have questions or require additional information, you may contact the researcher: Tamara Cornwell, National-Louis doctoral student, phone: 941-812-2836; email TamaraKCornwell@msn.com; 5110 Eisenhower Blvd. #102 Tampa, FL 33634.

If you have any concerns of questions before or during participation, which you feel have not been addressed by the researcher, you may contact one or more of the following National Louis University representatives:

Dr. Carol Burg: email: cburg@nl.edu; phone: (813) 397-2109; or by mail: 5110 Eisenhower Blvd. #102 Tampa, FL 33634

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_____
Teacher Name (Please Print)

_____ _____
Teacher Signature Date

_____
Researcher Name (Please Print)

_____ _____
Researcher Signature Date