ABSTRACT OF CAPSTONE

Kermit E. Belcher

The Graduate School
Morehead State University
March 1, 2014
TRANSFORMING EDUCATION INTO THE 21ST CENTURY
BY INTEGRATING 1:1 IPADS

Abstract of capstone

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

By
Kermit E. Belcher
Maysville, Kentucky

Committee Chair: John H. Curry, Assistant Professor
Morehead, Kentucky
March 1, 2014

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BY INTEGRATING 1:1 IPADS

Abstract

Teachers at Mason County High School are changing from predominantly teacher led instruction to increased student engagement by providing blended learning opportunities through technology integration. Every student and teacher at Mason County High School was provided an iPad as a resource to enhance instruction. The purpose of this case study is to document the journey of Mason County High School’s iPad 1:1 implementation. A result of the case study was the creation of an iPad 1:1 Integration Guide. The Integration Guide is a beneficial resource for any school considering an iPad 1:1 implementation. The iPad 1:1 Integration Guide was created using iBooks Author, available for download on iTunes University. Findings from the research are embedded into the 1:1 iPad digital integration guide. Chapters of the integration guide consist of the following:

• **Chapter 1 - Introduction.** The iPad 1:1 Journey documented as a Case Study. Why make the transition to Next Generation Learning with an iPad 1:1?

• **Chapter 2 - Administrative Considerations.** Planning, Collaboration, Cost Analysis, End User Device, and Implementation Considerations.
• **Chapter 3 - Instructional Components.** Professional Development / Next Generation Learning, Delivery of Instruction, Content Delivery, iPad Resources and Educational Apps.

• **Chapter 4 - Technical Aspects.** Cloud Based Computing, Network Infrastructure, Deployment / Mobile Device Management, Technical Assistance and Next Generation Classroom Equipment.

• **Chapter 5 - Student Impact.** Data Analysis Method and Local Context, iPad Focus Groups, Motivated Strategies for Learning Questionnaire (MSLQ), Achievement and Cost Analysis.

KEYWORDS: Analysis, Integration, Student, iPAD, Instruction
TRANSFORMING EDUCATION INTO THE 21ST CENTURY
BY INTEGRATING 1:1 IPADS

By

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DEDICATION

This capstone is dedicated to my parents who have given me support throughout my life. To Dana, my wife who sacrificed to care for our kids, made it possible for me to complete this work, and to my children Kade and Brynn Belcher who mean the world to me. To my family and friends who have always stood by me and to my grandparents that I truly miss. I cannot find words to express my gratitude to my family and friends. Their encouragement, enthusiasm, and faith in me throughout have been extremely helpful.
ACKNOWLEDGEMENTS

This capstone would not have been possible without the help of so many people. There are so many people to thank over the past three years. I wish to thank, first and foremost, my committee members at Morehead State University. Many Thanks go to Dr. John Curry for his expertise and support throughout this process. Dr. Curry and I continue to present on the iPad 1:1 journey and strive to improve the program based on findings derived from student and teacher focus groups. Also, thanks to Dr. Carol Christian for her guidance and encouragement. Memories from our trip to Costa Rica will last a lifetime. Thank you Krista Pack Barton for our collaboration and professional development opportunities provided by the Morehead State University 21st Century Education Enterprise. I consider it an honor to work with supportive members of the 21st Century Education Enterprise including Krista Pack Barton, Krys Lynam, Rachel Blackwell and Rebecca Roach.

I share the credit of my work with supportive and productive members of the Mason County School System. Student benefit from the iPad 1:1 integration would not be possible without the effort and dedication by so many stakeholders. A special thanks to Mason County Schools administrators, teachers, students, board of education, Sean Jackson, Steve Appelman, Dana Belcher, Kent Moore and members of the Mason County High School iT Team.

I am also grateful for extraordinary cohort II members from Morehead State University. The friendships formed and networking opportunities by our cohort members are invaluable.
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  Chapter 1
  Introduction - iPad 1:1 Journey Documented Case Study

  Chapter 2
  Administrative Considerations - Planning for an iPad 1:1

  Chapter 3
  Instructional Components - Key Instructional Elements for an iPad 1:1

  Chapter 4
  Deploying an iPad 1:1

  Chapter 5
  Data Results - What Does the Data Say?
EXECUTIVE SUMMARY

What is the core of the capstone?

The core of the capstone is an iPad 1:1 Integration Guide. Findings from the qualitative and quantitative mixed method data analysis are embedded into the 1:1 iPad Digital Integration Guide. The digital integration guide was created using iBooks Author, available for download on Apple iBooks store. The iPad 1:1 Integration Guide is based on a case study conducted of the Mason County High School iPad 1:1 implementation.

Teachers at Mason County High School are changing from predominantly teacher led instruction to increased student engagement by providing blended learning opportunities through technology integration. Every student and teacher at Mason County High School was provided an iPad as a resource to enhance instruction. The purpose of this case study is to document the journey of Mason County High Schools iPad 1:1 implementation.

There were 834 student iPads deployed by the Mason County High School student operated help desk. Throughout the Mason County School district the student help desk deployed 1,050 iPads, which was the 82nd largest iPad deployment (Forbes, 2012). Students in grades 9-12 had the opportunity to take home an iPad to extend learning beyond the school day by paying a take home user fee. A small percentage of students opted to check out the iPad in the morning before school then return the device at the end of the school day, otherwise known as a day user.
In conjunction with the iPad implementation, teachers at Mason County High School are in the process of changing instruction from teacher-led to more student engagement integrating technology. According to Bellanca and Brandt (2010) in the book 21st Century Skills – Rethinking How Students Learn, the educational system is caught between the traditional educational practices versus the innovation of teaching 21st Century skills. In order to change education, we must start with the learning environment. Teachers and administrators need to look for new ways to engage learners; such as new building designs that fit instruction, pods for workshops, collaboration, and the teacher serving as a facilitator of learning.

Professional development strategies need to be revamped providing teachers with resources and training to prepare students. The students should be engaged while the teachers delegate allowing the students to actually do the work. Collaboration is a key component enabling teachers to plan together and work together (Bellanca & Brandt, 2010). In order to meet student needs teachers should give up some control in the classroom. Students need the flexibility to be creative and collaborate. Incorporating project based learning and community based learning can be great ways to engage kids (Bellanca & Brandt, 2010)

Life and Career Skills

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
Leadership and Responsibility

Learning and Innovation Skills

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and collaboration

Information, Media, and Technology Skills

- Information Literacy
- Media Literacy
- Information and Communications Technology (ICT) Literacy

Wagner, T. (2010) in the book *The Global Achievement Gap*, points out the gap between what our best schools are teaching versus the skills to be successful in the workforce, college and as citizens. Wagner interviewed hundreds of business people to come up with the seven survival skills for the 21st Century. Those seven survival skills include:

1. Critical thinking and problem solving
2. Collaboration and leadership
3. Agility and adaptability
4. Initiative and Entrepreneurialism
5. Effective oral and written communication
6. Accessing and analyzing information
7. Curiosity and imagination

Throughout the chapters of *The Global Achievement Gap* Wagner (2010), addressed the “Old World of School” based on passive learning to closing the achievement gap. We need to move away from the current model that rewards both memorization and a focus on test preparation. Wagner noted that tests rarely require
students to apply their learning and almost never require students to exhibit proficiency in higher forms of cognition. According to Wagner (2010), the most important overachieving academic skills are writing and research. He suggested that these habits of mind that matter most for success in college are: intellectual openness, inquisitiveness, analysis, reasoning, argumentation and proof, precision and accuracy, and problem solving.

Wagner suggests the need to reinvent the education profession. He believes existing professional development and evaluation systems are inadequate. As stated by Wagner (2010), we need to use technology to motivate today’s students and tomorrow’s workers. Although he admits everything kids do with technology is not positive. Finally, to close the achievement gap the author gives examples of some schools that work. A couple of these schools are High Tech High and MET. These schools are successful because of refusal to teach to teach the test, and by allowing no stand-alone courses. Rather, academic content is taught through interdisciplinary projects and personalized learning. “Instead of having students take classes and maybe eventually figuring out what their interests are, we start with helping every student to find their interest and then build a learning plan around it” (Wagner 2010).

**Who is the capstone meant to impact?**

The Integration Guide is a beneficial resource for any school considering an iPad 1:1 implementation. The vast array of topics covers iPad 1:1 planning, management, deployment, instructional components, technical aspects and student impact. Each chapter contains valuable information of lessons learned during the
Mason County High School iPad 1:1 implementation. The integration guide would be beneficial to school administrators, teachers, students, parents, board of education members, technicians, chief information officers, and school Superintendents.

Chapters of the integration guide consist of the following:

- **Chapter 1 - Introduction.** The iPad 1:1 Journey documented as a Case Study. Why make the transition to Next Generation Learning with an iPad 1:1?

- **Chapter 2 - Administrative Considerations.** Planning, Collaboration, Cost Analysis, End User Device, and Implementation Considerations.

- **Chapter 3 - Instructional Components.** Professional Development / Next Generation Learning, Delivery of Instruction, Content Delivery, iPad Resources and Educational Apps.

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- **Chapter 5 - Student Impact.** Data Analysis Method and Local Context, iPad Focus Groups, Motivated Strategies for Learning Questionnaire (MSLQ), Achievement and Cost Analysis.

**How was the capstone project implemented?**

Collaboration was a key component to the success of this capstone project. There are many stakeholders involved including teachers, students, administrators,
parents, community, and Morehead State University’s 21st Century Education Enterprise. Administrators adapted policies and procedures in order to accommodate this instructional shift and influx of technology. Changes to instruction, routines and procedures, finances, and logistics were adapted to accommodate 1:1 technology. A team of teachers, known as the iTeam, meets on a regular basis to make collaborative decisions about the iPad 1:1 initiative. The iTeam is comprised of teachers from each department, school principal, technology resource teacher, and chief information officer. Classroom teachers collaborate within content specific areas to share lessons, ways to improve student engagement, and instructional techniques by integrating technology.

Students collaborate with peers and teachers to transition from teacher led to active student participation in the lesson. Integration of a content management system such as Blackboard or Edmodo enhances communication between students and teachers. Offering exposure to a content management system help students make a smooth transition to online courses offered at post secondary institutions. Students gain experience by operating a student helpdesk modeled after Apple’s Genius Bar. The helpdesk students handle technical requests and produce “how to” instructional videos for students and staff to assist with communication and training.

Dr. Curry along with the Morehead State University 21st Century Enterprise assist with focus groups, student surveys and data analysis. Decisions are made based on the data analysis which helps make improvements to the iPad 1:1 program. Continued adjustments are made based on student and teacher recommendations from
focus groups. For example, the student operated help desk recently added an online request form to allow blocked web sites based on student requests suggested by student focus groups. The 21st Century Education Enterprise provides professional development for teachers and administrators. The focus of the professional development is the integration of 1:1 technology in order to provide meaningful, real world, effective and engaging student instruction.

**Why were this capstone and related strategies selected?**

Our current model of education, which is based in the Industrial Age, no longer meets the needs of students living in the Information Age (Jukes, McCain, & Crockett, 2010).

As stated by Jukes, Kelly & McCain (2009), in the book *Teaching the Digital Generation - No More Cookie Cutter High Schools*, capitalizing on the astounding power of new electronic tools, the world outside of education has moved beyond the idea of mass production. We are now in the beginnings of a whole new area of technologically driven mass customization and the age of the individual. It is critical for parents and educators to grasp that this digital immersion is changing the way kids think. These digital tools provide kids with an unprecedented level of interaction and immediate feedback. As a result, kids today crave interactivity in their lives. Technological change is increasing. This means that equipping schools with new technology will always be with us. Because the role of the public school system is to be the great equalizer in society, ensuring that those who are economically disadvantaged are given the same opportunities as those from wealthier households, it
is critical that we embrace the idea that doing our best to give schools the newest technology possible will be an ongoing goal in the 21st century (Jukes, Kelly, & McCain 2009).

Today’s public education system originated in an era when more than ninety percent of young people still lived on farms or in rural areas. Schools adopted a six-hour day and the nine-month calendar to accommodate farm life. Summers were reserved for harvesting crops and other agriculture activities. Even as we progressed through the Industrial Age of the 20th Century, many of the attributes of schools for agriculture life persisted. More astounding is that many of these attributes persist today. And similarly, many of the attributes of Industrial Age schools persist in today’s schools in the world of the Information Age (Jukes, Kelly, & McCain 2009).

According to Linda Darling-Hammond (1997) in The Right to Learn, in 1908 William Wirt came up with the idea of the “platoon school.” Hoping to save on wasted space and solve overcrowding in schools, Wirt devised a system in which students circulate through the school from one classroom to another, with different teachers teaching them different subjects for short periods of time (Darling-Hammond, 1997). Under this system, schools became modeled after the assembly line, and teachers began to specialize and teach only one subject, over and over, all day. Teachers were given classrooms in which they would teach for short periods of time, typically an hour. A bell would ring, and the students would move from one specialist to another. The basic layout of the high school we have today, with its hallways, classrooms, and departments, was created before the Great Depression. As
we have seen, most of the ideas that form the basis of our current schools were well established by the 1920s. That means schools have looked the same for more than 80 years!

As stated by Jukes, Kelly, & McCain (2009) in *Teaching the Digital Generation*, there is mounting evidence that the schools designed for the 19th and 20th centuries are not working well in the modern digital world. We cannot carry on preparing students for the farms and factories of yesterday while the world jumps to light speed with biotechnology, nanotechnology, neurotechnology, global high speed wired and wireless networks, and incredibly powerful personal portable devices. The future of public high schools is not assured. Given the statistics, growing worldwide competition, mounting political pressures, and the emergence of truly viable alternatives, we should not assume that high schools as we’ve known them for generations can or will survive for another decade. As fundamentally contradictory as it may seem, there are urban school districts with declining enrollments in cities with growing populations (Jukes, Kelly, & McCain 2009).

The world we live in has evolved into the Information Age. Meanwhile, our high schools continue to operate on the ideas and assumptions from the Industrial Age. As a result, there is a fundamental disconnect between students and the schools they attend. Jukes, Kelly, & McCain (2009) emphasize to readers that the industrial model is not the standard school suitable for most students. The teacher tells students to pay particular attention to this assignment because there will be a test on the material next period. Sound familiar? Of course it does, because the scene is
repeated over and over again each day in our high schools all across North America. Teachers and students meet in classrooms. Students are given work to do using textbooks that focus on committing content to memory. Students are motivated to do the work of memorization because their performance on tests will be recorded. Many teachers, in desperation, require seemingly endless practice with items similar to those on an approaching accountability test. This dreary drilling often stamps out any genuine joy students might (and should) experience while they learn (Popham, 2005).

Simply adding technology to the classroom will not enhance teaching and learning. In the book Disrupting Class, Christensen, C., Horn, M., & Johnson C. (2008) contends that $60 billion was spent over the past two decades putting computers and learning software in schools with no effect on student achievement. We are just using computers to teach the same way that’s always been taught. Essentially “cramming” technology into existing lessons is how he refers to our current method of technology integration. Christensen, C., Horn, M., & Johnson C., (2008) believe we are trying to tweak education but their needs to be a disruptive innovation. The authors define “Theory of Disruptive Innovation as the process by which an innovation transforms a market whose services or products are complicated and expensive into one where simplicity, convenience, accessibility, and affordability characterize the industry.” Industry examples of disruptive innovation are mainframe computers that only companies could afford to a personalized computer that many people have in their homes today. Another example was the iPod, which stores and enables us to listen to music opposed to compact disks CDs. Digital cameras were a
disruptive innovation that Kodak capitalized on while Polaroid did not. Christensen predicts technology will be the innovation that will disrupt schools (Christensen, C., Horn, M., & Johnson C., 2008).

In 2010, Project RED conducted the first large-scale national study to identify and prioritize the factors that make some K-12 technology implementations perform dramatically better than others. Project RED states in order to revolutionize education, schools must change the way teaching and learning is conducted. Today’s teaching techniques have not evolved along with technology of the 21st Century (Cuban, 2001).

According to Apple Classrooms of Tomorrow-Today (ACOT2, 2008), readily available technology along with a multidisciplinary approach to instruction will enhance teaching and learning. Apple Classrooms of Tomorrow–Today is a collaborative effort with the education community to identify the essential design principles for the 21st century high school by focusing on the relationships that matter most: Those between students, teachers, and curriculum.
When was the Capstone Implemented?

The capstone was a culmination of planning, preparation and implementation starting in 2007. The iPad 1:1 Integration Guide should help speed up the implementation process for other schools that would like to achieve an iPad 1:1 implementation. The timeline below depicts various stages of planning, preparation, implementation, evaluation, continuous improvement, data collection, research, analysis, and professional development.
### 2007-2011 – Inception, Planning, and Preparation

<table>
<thead>
<tr>
<th>Vision</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling the 1:1 vision - top down (unsuccessful)</td>
<td></td>
</tr>
<tr>
<td>Network infrastructure</td>
<td></td>
</tr>
<tr>
<td>School visits</td>
<td></td>
</tr>
<tr>
<td>IT department technical training</td>
<td></td>
</tr>
<tr>
<td>Classroom set of devices to pilot a simulated 1:1 environment</td>
<td></td>
</tr>
<tr>
<td>Gather capacity among leadership and teachers</td>
<td></td>
</tr>
<tr>
<td>Selling the 1:1 vision - bottom up (successful)</td>
<td></td>
</tr>
<tr>
<td>Determine the best technological instructional device for students and staff</td>
<td></td>
</tr>
<tr>
<td>Restructure the technology replacement cycle</td>
<td></td>
</tr>
<tr>
<td>Cost analysis</td>
<td></td>
</tr>
<tr>
<td>Present to the Board of Education the vision for funding and instruction</td>
<td></td>
</tr>
<tr>
<td>Lease process</td>
<td></td>
</tr>
<tr>
<td>Increased bandwidth to 100MB</td>
<td></td>
</tr>
</tbody>
</table>

### 2012-2013 – Implementation and Evaluation

| Established teacher leadership team (iTeam) | |
| Student operated helpdesk – rollout, technical repair requests, & instructional videos | |
| Morehead State University collaboration - Instructional professional development | |
| Develop policies and procedures | |
| Digital citizenship for students - Digital Drivers License | |
| Acceptable use policy | |
| Public relations | |
| Rollout process | |
| Layered sync approach | |
| Content filtering | |
| Learning management system (LMS) - Edmodo | |
| Mobile device management system (MDM) | |
| Changing instruction to integrate technology | |
| Established an Institutional Review Board (IRB) | |
| Administered the MSLQ student engagement survey to students (semi-annual) | |
| Conducted quarterly teacher interviews | |
| Student focus groups - quarterly | |
| Conducted classroom walkthroughs and observations | |
## 2013-2014 – Evaluation and Continuous Improvement

### Part A – Capstone / Integration Guide Timeline

<table>
<thead>
<tr>
<th>Activity</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalize capstone proposal</td>
<td>July 22nd</td>
</tr>
<tr>
<td>Revise the IRB</td>
<td>July 22nd</td>
</tr>
<tr>
<td>Continue the data collection process</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Begin development of an 1:1 iPad integration guide</td>
<td>August 1st</td>
</tr>
<tr>
<td>Create chapter outlines</td>
<td>August 15th</td>
</tr>
<tr>
<td>Establish sections for each chapter</td>
<td>September 15th</td>
</tr>
<tr>
<td>Rough draft of each chapter / section</td>
<td>September 30th</td>
</tr>
<tr>
<td>Complete Chapter 1 of the integration guide with subsequent sections</td>
<td>October 30th</td>
</tr>
<tr>
<td>Complete Chapter 2 of the integration guide with subsequent sections</td>
<td>November 30th</td>
</tr>
<tr>
<td>Complete Chapter 3 of the integration guide with subsequent sections</td>
<td>December 30th</td>
</tr>
<tr>
<td>Complete Chapter 4 of the integration guide with subsequent sections</td>
<td>January 30th</td>
</tr>
<tr>
<td>Embed research data in digital integration guide</td>
<td>August – January</td>
</tr>
<tr>
<td>Post digital integration guide to iTunes University</td>
<td>February 15th</td>
</tr>
<tr>
<td>Submit capstone project – Case study</td>
<td>February 30th</td>
</tr>
<tr>
<td>Submit signature page to the graduate school staff for approval at least four weeks before final defense</td>
<td>March 3rd</td>
</tr>
<tr>
<td>Oral defense</td>
<td>April 7th</td>
</tr>
</tbody>
</table>

### Part B – Continued Data Collection, Research, Analysis, and Instructional Improvement

<table>
<thead>
<tr>
<th>Activity</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview teachers</td>
<td>September, January, and March</td>
</tr>
<tr>
<td>Conduct student focus groups</td>
<td>September, January, and March</td>
</tr>
<tr>
<td>Administer the MSLQ student engagement survey to students</td>
<td>August and March</td>
</tr>
<tr>
<td>Present findings at national and state conferences</td>
<td>TBD</td>
</tr>
<tr>
<td>Make instructional improvements based on data</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Encourage meaningful instructional uses of 1:1 technology</td>
<td>PLC training</td>
</tr>
<tr>
<td>Provide content specific teacher training with Morehead State University</td>
<td>PLC training</td>
</tr>
<tr>
<td>Digital content distribution - iTunes U, iBooks, &amp; digital textbooks</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Take advantage of a content management system for communication and college preparation</td>
<td>August</td>
</tr>
<tr>
<td>Eliminate seat time to offer online courses 9-12</td>
<td>September</td>
</tr>
<tr>
<td>Increase bandwidth to 250 MG</td>
<td>November</td>
</tr>
<tr>
<td>Take advantage of 1:1 for assessments</td>
<td>August – May</td>
</tr>
<tr>
<td>Encourage immediate feedback with technology integration</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

**Impact of the capstone**

A result of the case study was the creation of an iPad 1:1 Integration Guide.

The case study was structured based on the book *The Art of Case Study Research* (Stake, 1995). A case study is expected to reflect the complexity of a single case.

Case study is the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances (Stake, 1995). Findings from the mixed method data analysis are embedded into the 1:1 iPad Digital Integration Guide. The impact of this case study was evaluated by qualitative and quantitative data analysis. Qualitative data analysis includes student and teacher focus groups, walk-throughs and observation. Quantitative data analysis includes attendance, ACT, college and career readiness, behavior, graduation rate and the Motivated Strategies for Learning Questionnaire (MSLQ).

**Limitations of the study / Local Context**

The case study is limited to data from students in grades 9-12 attending Mason County High School. Only schools with similar make up should generalize the results from the data. Mason County High School is located in rural Maysville, Kentucky with an estimated county population of 17,512 in 2012. Mason County High School is one of four schools within the Mason County School District. The
district has a total of 2,706 students excluding preschool. Enrollment at Mason County High School remains consistent with 834 students grades 9-12. Sixty-two percent of the student population is free or reduced lunch and 9 percent are minority. According to the Census Bureau the estimated median household income from 2007-2011 was $40,678. Click on the following link for additional Mason County facts provided by the Kentucky Center for Education and Workforce Statistics. The Kentucky P-20 Data Collaborative produces the 2012 County Profile. The Collaborative is a joint effort of the Kentucky Department of Education (KDE), Council on Postsecondary Education (CPE), Education Professional Standards Board (EPSB) and the Kentucky Education and Workforce Development Cabinet. The report includes the most current data available on demographics, employment, college readiness and educational attainment.

http://kentuckyp20.ky.gov/CountyProfileReports.aspx

Reflections

The initial thought process of my Capstone was a traditional dissertation method researching primarily the impact of an iPad 1:1 on student engagement. The project evolved into a case study documenting the Mason County High School iPad 1:1 journey. An iPad 1:1 Integration Guide was created to share the innovative Capstone project. The impact of student engagement in an iPad 1:1 environment is still a component of the case study. However, the case study is much broader now including all aspects of an iPad 1:1 implementation.
Morehead State University’s practitioner-based doctoral approach helped me grow professionally as a leader. The leadership skills attained positively impacted my job performance at Mason County Schools. The coursework, networking and Capstone project directly benefited the Mason County School system. Schools around the nation can benefit from the iPad 1:1 Integration Guide. The Integration Guide demonstrates the importance of student access to technology. Schools considering a 1:1 implementation can use the Integration Guide to help speed up the implementation process, ensure an effective implementation and learn from Mason County High School’s experience.

Even though today’s students are born digital natives that does not mean they will all embrace technology. The high school needs to make a conscious effort to inform students the benefits of exposure to technology. Upon reflection of the case study the iPad 1:1 implementation was an overall success in terms of providing students an opportunity for Next Generation Learning. There were numerous stakeholders that made the iPad implementation possible. Students have access to technology during school and the iPads extend learning beyond the school day. The daily operations of school business are shifting from predominately teacher led to increased student engagement. The academic data supports a moderate increase in student achievement. Based on the data and improvements made to instruction I predict this trend to continue upward. Each day there are more resources available for the iPad to enhance student achievement. Teachers and students continue to
become more comfortable integrating the iPad as a tool in the classroom.

Benefits of the Mason County High School iPad 1:1

- Change of instruction from the teacher stand and deliver or students sit and get.
  
  Change instruction from teacher led to increased student engagement.

- Provide ease of access to technology for ALL students. Students rarely had access to technology prior to the iPad implementation. An instructional device levels the playing field for all students. Some students would never have the opportunity to own a device such as an iPad if MCHS did not provide them one.

- Help student’s transition from high school to post secondary. With the iPad students are being exposed to flipped classroom models, learning management systems similar to blackboard, online courses, hybrid classes and blended learning models.

- Enhance student engagement, communication and online collaboration.

Next Steps

- Challenge Based / Project Based Learning

- Increase Blended Learning Opportunities

- Expand Online Course Offerings

- Enhance Digital Content and Instructional Resources
- Continued Professional Development

The cost of the iPad 1:1 can be sustained by reallocating money from the traditional technology replacement cycle. Tablets are more affordable and ease of access is more efficient than limited desktops and notebooks within each classroom. The money previously spent on traditional textbooks, which in some cases are obsolete soon after their purchase, is now being allocated toward digital textbooks that can be updated often. Copy and paper costs have been reduced by nearly 32% and continue to decrease. That is a significant reduction of $12,000 based on MCHS paying $40,000 annually for printing. Although the iPad 1:1 expense is more than the savings incurred, the reallocation of funds was still a wise investment for students. Mobile adoption continues to explode replacing desktops by the millions! In 2010, 11 million tablets were in use compared to the staggering projection of 126 million US tablet consumers by 2016 (Forrester Research Consumer PC and Tablet Forecast, 2011 to 2016).
Related Research

According to Lool, Seow, Zhang, Hyo-Jeong, Wenli, and Wong (2010), over the next 10 years, personal, portable, wirelessly networked technologies will become ubiquitous in the lives of learners. Donovan, Green, and Hansen (2011) compared two teacher candidate credential program models: A 1:1 laptop program with ubiquitous technology use and a traditional credential program with no laptops. One hundred nine teacher candidates participated in this study. Twenty-eight were enrolled in the 1:1 laptop cohort, whereas 81 were enrolled in four regular (no laptop) cohorts. Teacher candidates completed a pretest and posttest technology survey online using Survey Monkey. Findings from this study indicated that technology rich
classrooms better prepare students than do programs that take a more traditional approach.

According to Nelson, Thomas, and Kuh (2005) there appears to be a strong positive relationship between using information technology for educational purposes and involvement in effective educational practices such as active and collaborative learning and student-faculty interaction. In addition, when students use information technology it may increase their opportunities for other types of engagement.

Although computers and technology are prevalent throughout our society, teachers have yet to incorporate technology into regular instructional practices (Cuban, 2001). From Cuban’s perspective, teachers do not understand how technology can be integrated, and school systems have not been restructured to fully support integration. Current professional development efforts are moving from an emphasis on technical skills to a focus on facilitating student-centered pedagogy (Russell, Bebell, O’Dwyer & O’Connor, 2003).

Problem-based learning is a teaching method in which students learn content knowledge and problem-solving skills through investigating and solving structured problems (Hmelo-Silver, 2004). Technology often plays an important role during the problem-based learning process, serving as a critical tool for information searching, organizing and analyzing data, and presenting solutions. Wilkie (2004) argues that a problem-based approach demands a change in the role of the teacher. In the transformed lecture the teacher did not present the subject matter in its entirety, but rather gave an introduction and provided a background for the students’ work on the
problem. Their role changed to that of guide, answering questions, promoting
dialogue and recognizing students’ needs of assistance, all areas of importance in
problem-based learning (Donnelly, 2004; Wilkie, 2004).

In contrast to this type of technology-enhanced problem based learning,
Dalsgaard, Godsk, and Mikkel (2007) stated traditional university courses could be
characterized as curriculum-based and lecture-based teaching. This approach
represents a concept of knowledge as content provided by the teacher. Furthermore,
one-way lectures, to a large extent, are not interactive, because students are presented
with answers rather than having to solve problems or find answers for themselves.
Finally, this approach does not focus on the individual student. Every student is
presented with the same texts and the same lectures.

Another 21st Century learning methodology is Challenge Based Learning
(CBL). According to Johnson and Adams (2011), CBL is an engaging
multidisciplinary approach to teaching and learning that encourages students to
leverage the technology they use in their daily lives to solve real-world problems.
CBL is collaborative and hands-on, asking students to work with peers, teachers, and
experts in their communities and around the world to ask good questions, develop
deeper subject area knowledge, accept and solve challenges, take action, and share
their experience. In 2009 and 2011, Apple Education conducted two studies on CBL.
The studies conclude CBL is effective in building 21st Century Skills.
Graphical Representation

Capstone Project

**iPad 1:1 Implementation Guide**
MAISON COUNTY HIGH SCHOOL

iPad 1:1

Implementation Guide
Integration Guide

- INTRODUCTION - BACKGROUND
- ADMINISTRATIVE CONSIDERATIONS
- TECHNICAL ASPECTS
- INSTRUCTIONAL COMPONENTS
- DATA RESULTS

Forbes List: Top 100 iPad Rollouts by Enterprises & Schools
Mason County High School, KY #82

Kermit Belcher
"Insanity: doing the same thing over and over again and expecting different results."

Albert Einstein

CHAPTE R 1

Introduction

Why implement a 1:1 instructional device for all students? Will student access to technology improve test scores, increase student engagement or simply cause another distraction in the classroom? This Integration Guide will address those questions and much more while taking you through the journey of Mason County High School’s iPad 1:1 implementation. Each section is comprised of strategies and lessons learned from the Introduction, Administrative Considerations, Instructional Components, Technical Aspects, and Data Results.

Section 1 - Introduction - The iPad 1:1 journey documented as a Case Study. Why make the transition to Next Generation Learning with an iPad 1:1?


Section 3 - Instructional Components. Professional Development / Next Generation Learning, Delivery of Instruction, Content Delivery, iPad Resources and Educational Apps.
CHAPTER 1

iPod 1:1 Journey Documented Case Study

INTRODUCTION

1. Introduction to the 1:1 journey documented as a Case Study.

2. Why make the transition to Next Generation Learning with an iPod 1:1?

• Section 4 - Technical Aspects. Cloud Based Computing, Network Infrastructure, Deployment / Mobile Device Management, Technical Assistance and Next Generation Classroom Equipment.

• Section 5 - Data Results - Data Analysis Method and Local Context, iPod Focus Groups, Motivated Strategies for Learning Questionnaire (MSLO), Achievement and Cost Analysis.

The Journey

Mason County High School is located in rural Maysville, Kentucky with an estimated county population of 17,512 in 2012. Mason County High School is one of four schools within the Mason County School District. The district has a total of 2,706 students excluding preschool with 834 of those students grade 9-12. Sixty-two percent of student population is free or reduced lunch and 9 percent are minority.

Each school in the Mason County School District has a unique technology model based on individualized technology plans. The two elementary schools have two iPads and two MacBooks per classroom. Mason County Middle School has a blended learning environment with a mixture of iPads and MacBooks. Mason County High School provides an iPad for every student and iMac labs for creation stations. The school district is enriched with technology access for all students K-12. Mason County Schools did not want the younger students to have limited technology access in order to provide a 1:1 device
for every child at the high school level. Technology access for all students is a priority for the district.

In August 2012, each student and teacher at Mason County High School was provided an iPad as a resource to enhance instruction. There were 834 student iPads deployed at Mason County High School (MCHS) by the Mason County High School student operated help desk. The MCHS student help desk deployed a total of 1,050 iPads throughout the Mason County School district. This was the 82nd largest iPad deployment in 2012 according to Forbes. By paying a “take home user” fee, students in grades 9-12 have the opportunity to take home an iPad to extend learning beyond the school day. A small percentage of students opted to check out the iPad in the morning before school then return the device at the end of the school day, otherwise known as a “day user”.

The iPad 1:1 implementation didn’t happen overnight. The process took an immense amount of planning and teamwork with various stakeholders. The journey started with the realization that teachers and administrators had ease of access to technology but the students had limited access to instructional devices. During staff meetings our teachers would collaborate with notebook computers but our classrooms had a limited amount of student computers. The standard classroom setup consisted of only two computers located in the back of the classroom for an average class size of twenty-six students, which were rarely used because of availability. Only two computer labs were accessible for 834 students. The computer labs were primarily used to type English papers, assessments, and occasionally conduct Internet research. The library media center and computer labs were occupied at least nine weeks every school year to assess students conducting Measured Academic Progress (MAP) testing.

Mason County Schools were doing students an injustice by not preparing them for the digital transition from high school to post secondary education. This became apparent to me recently when I took an online course at Morehead State University. Online courses were a relatively new experience because my previous graduate experience involved meeting face to face with
classmates and the teacher on a regular basis. Even as a lifelong educator, participating in an online course was an adjustment using an online management system, such as Blackboard, to guide the class. The online and hybrid graduate course offerings helped me reflect upon the fact that we send high school students to college with limited exposure to technology and online courses. Students have become accustomed to listening to teachers lecture, taking notes, then studying the notes for the test. Some students become dependent on the teacher in a traditional classroom. Online and hybrid courses require the ability for students to work independently. Basically the school system was sending students to college with limited access to technology and failing to encourage creativity because of teacher-dominated instruction. This traditional classroom structure is common throughout the United States. Actually, it can be argued that standardized testing encourages this type of traditional classroom model.

Danville Superintendent, Carmen Coleman, is leading the way away from standardized testing. Danville Independent is leading the state in a concept called project-based learning. This model requires students not only to learn content but also prove they can apply it so they are prepared for college or a career. Coleman is preparing to ask state and federal officials for permission to eliminate two standardized tests that she considers meaningless. Her goal is to eliminate Kentucky Performance Rating for Educational Progress and end-of-course tests for high school students. Those tests would be replaced with tests that reflect project-based learning. Coleman wants to keep one standardized test — the ACT — because it's required by many colleges as a measure of whether a student is ready for college or a career.

The world we live in has fundamentally changed. Our students have moved into the Information Age. Meanwhile, our high schools continue to operate on the ideas and assumptions from the Industrial Age. As a result, there is a fundamental disconnect between students and the schools they attend. Jukes, Kelly, & McCain (2009) emphasize to readers that the
industrial model is not the standard school suitable for most students. The teacher tells students to pay particular attention to this assignment because there will be a test on the material next period. Sound familiar? Of course it does, because that scene is repeated over and over again each day in our high schools all across North America. Teachers and students meet in classrooms. Teachers talk and students listen. Students are given work to do using textbooks that focus on committing content to memory. Students are motivated to do the work of memorization because their performance on tests will be recorded. Many teachers, in desperation, require seemingly endless practice with items similar to those on an approaching accountability test. This dreary drilling often stamps out any genuine joy students might (and should) experience while they learn. (Popham, 2005)

In conjunction with the iPad 1:1 implementation Mason County High School is changing the school’s instructional approach. The iPad 1:1 implementation at MCHS consists of a two-phase approach. The first phase was the overall iPad implementation. The second phase is changing instruction while using the iPad as a tool to meet student needs. Neither task is easy but changing instructional practice and mind set established prior to the industrial revolution is difficult to say the least. To assist with the transition Mason County Schools formed a Next Generation Learning (NxGL) Team. The NxGL team participated in a Next Generation Leadership Academy provided by the University of Kentucky. The Next Generation Leadership Academy (NxGL Academy) takes school leaders who know the system needs to change and helps them work through implementation of innovative ideas. As a result the NxGL team is reinventing the learning environment at MCHS. Listed below are some aspects being considered by the NxGL team.

“Our current model of education, which is based in the Industrial Age, no longer meets the needs of students living in the Information Age.” (Jukes, McCain, & Crockett, 2010)
• Innovative Scheduling
• Professional Learning Communities
• Mastery Learning
• Project Based / Challenged Based Learning
• Flipped Classroom Model
• Blended Learning
• Middle College
• Career Clusters
• Mentorship
• Digital Portfolios
• College / Career Readiness
• Student Capstone Presentations

Why make the Next Generation Learning transition with an iPad 1:1?

Simply adding technology to the classroom will not enhance teaching and learning. The book, Disrupting Class, contends that $60 billion was spent over the past two decades putting computers and learning software in schools with no effect on student achievement. Christensen, C., Horn, M., & Johnson C., (2008) state we are just using computers to teach the same way that’s always been taught. Essentially “cramming” technology into existing lessons is how he refers to our current method of technology integration. Christensen, C., Horn, M., & Johnson C., (2008) believe we are trying to tweak education but there needs to be a disruptive innovation. The authors define “Theory of Disruptive Innovation as the process by which an innovation transforms a market whose services or products are complicated and expensive into one where simplicity, convenience, accessibility, and

“We are just using computers to teach the same way that’s always been taught.”

Clayton Christensen

Essentially “cramming” technology into existing lessons is how Clayton refers to our current method of technology integration.
affordability characterize the industry.” Industry examples of disruptive innovation are mainframe computers that only companies could afford to a personalized computer that many people have in their homes today. Another example was the iPod, which stores and enables us to listen to music opposed to compact disks CD’s. Digital cameras were a disruptive innovation that Kodak capitalized on while Polaroid didn’t. Christensen predicts technology will be the innovation that will disrupt schools. (Christensen, C., Horn, M., & Johnson C., 2008)

According to Christensen, schools need to move away from batches of students in classrooms and grade levels. He states schools group students in batches then teach to the middle. Christensen lobbies for 1:1 technology, mastery learning, and module student centered approach using software and individualized computer instruction.

The book, 21st Century Skills – Rethinking How Students Learn, states the educational system is caught between traditional education practices versus the innovation of teaching 21st Century skills. In order to change education we must start with the learning environment. Teachers and administrators need to look for new ways to engage learners such as new building designs that fit instruction, pods for workshops, collaboration, and the teacher serving as a facilitator of learning.

According to Linda Darling-Hammond author of The Right to Learn (1997), in 1908 William Wirt came up with the idea of the “platoon school.” Hoping to save on wasted space and solve overcrowding in schools, Wirt devised a system in which students circulate through the school from one classroom to another with different teachers teaching them different subjects for short periods of time. (Darling-Hammond, 1997) Under this system, schools became modeled after the assembly line, and teachers began to specialize and teach only one subject, over and over, all day.

“If we teach today as we taught yesterday, we rob our children of tomorrow.”

John Dewey
Teachers were given classrooms in which they would teach for short periods of time, typically an hour. A bell would ring, the students would move from one specialist to another. The basic layout of the high school we have today, with its hallways, classrooms, and departments, was created before the Great Depression. As we have seen, most of the ideas that form the basis of our current schools were well established by the 1920’s. That means schools have looked the same for more than 80 years! “No generation in history has ever been so thoroughly prepared for the Industrial Age,” David Warlick.

Today’s public education system originated in an era when more than 90% of young people still lived on farms or in rural areas. Schools adopted a six-hour day and the nine-month calendar to accommodate farm life. Summers were reserved for harvesting crops and other agriculture activities. Even as we progressed through the Industrial Age of the 20th century, many of the attributes of schools for agriculture life persisted. More astounding is that many of these attributes persist in today's schools in the world of the Information Age. (Jukes, Kelly, & McCain 2009)

Seth Godin recently published a 30,000 word manifesto entitled “Stop Stealing Dreams - What is School For?” In his manifesto Godin states, “I imagine a different set of goals and how we can reach them. One thing is certain: If we keep doing what we've been doing, we're going to keep getting what we've been getting.”

According to Godin, school was invented to create a constant stream of compliant factory workers to the growing businesses of the 1900s. It continues to do an excellent job at achieving this goal, but this is not a goal we need to achieve any
longer. The economy has changed, probably forever. School has not. Our kids are too important to sacrifice to the status quo. Take a look at Godin’s thought provoking video “Stop Stealing Dreams - What is School For?”

As stated in the book, *Teaching the Digital Generation - No More Cookie Cutter High Schools*, there is mounting evidence that the schools designed for the 19th and 20th centuries are not working well in the modern digital world. We cannot continue preparing students for the farms and factories of yesterday while the world jumps to light speed with biotechnology, nanotechnology, neurotechnology, global high speed wired and wireless networks, and incredibly powerful personal portable devices. The future of public high schools is not assured. Given the statistics, growing worldwide competition, mounting political pressures, and the emergence of truly viable alternatives, we should not assume that high schools as we’ve known them for generations can or will survive for another decade. As fundamentally contradictory as it may seem, there are urban school districts with declining enrollments in cities with growing populations. (Jukes, Kelly, & McCain 2009)

Jukes, Kelly, & McCain stated in the book, *Teaching the Digital Generation*, that capitalizing on the astounding power of new electronic tools, the world outside of education has moved beyond the idea of mass production. We are now in the beginnings of a whole new area of technologically driven mass customization and the age of the individual. It is critical for parents and educators to grasp that this digital immersion is changing the way kids think. These digital tools provide kids with an unprecedented level of interaction and immediate feedback. As a result, kids today crave interactivity in their lives. Technological change is increasing. This means that equipping schools with new technology will always be with us. Because the role of the public school system is to be

“No generation in history has ever been so thoroughly prepared for the Industrial Age”

David Warlick
the great equalizer in society, ensuring that those who are economically disadvantaged are given the same opportunities as those from wealthier households, it is critical that we embrace the idea that doing our best to give schools the newest technology possible will be an ongoing goal in the 21st century. (Jukes, Kelly, & McCain 2009)
Administrative Considerations

What factors should the school board, teachers, superintendent, chief information officer, principal or other stakeholders take into consideration when implementing an iPad 1:1?

Leadership should...

- Provide a vision, determine instructional goals, build a team, then sell the vision.
- Build capacity among stakeholders.
- Conduct a Cost Analysis. Analyze the initial investment plus the ability to sustain a 1:1 project.
- Determine the best end user device. What device meets your school’s instructional goals?
- Plan logistics of the implementation including policies, procedures, digital citizenship and timeline of events.

“Good teaching practices should drive technology use instead of technology driving the practice of teaching.”

*International Society for Technology in Education*
What is the vision for an iPad 1:1 implementation?

Determine a solid instructional strategy for the school considering an iPad 1:1 implementation. The intent of Mason County High School’s iPad 1:1 implementation was not presented on the premise to increase test scores. Although increasing student performance would be a definite benefit.

Listed below are components derived from the vision of Mason County High School’s iPad 1:1 implementation:

- An instructional device levels the playing field for all students. Some students would never have the opportunity to own a device such as an iPad if MCHS did not provide them one.
- Provide ease of access to technology for ALL students. Students rarely had access to technology prior to the iPad implementation.
- Help student’s transition from high school to post secondary. With the iPad students are being exposed to flipped classroom models, learning management systems similar to blackboard, online courses, hybrid classes and blended learning models.
- Change instruction from stand and deliver / sit and get.
- Enhance student engagement, communication and online collaboration.
- Delivery of Instruction - Flipped classroom model, blended learning model and project based learning.
• Content delivery - Digital textbooks, Online assessment, iTunes University, iBooks Author and exposure to a learning management system.

After the leadership team develops a vision, determine what data will be used to measure student success.

Below are areas to consider for the data collection process and analysis:

• Student technology access / device ratio
• Student and teacher focus groups
• Surveys, walkthroughs and observations
• Financial impact
• Achievement, Growth, Gap, ACT, Graduation Rate, College and Career Readiness and ACT
• Attendance rate

Data based decision making should be the foundation of the school’s vision. However, student academic success is not the only measure to consider for a successful iPad 1:1 implementation. Consider if the efficiency of daily operations for school business can be improved upon. For instance, productivity apps for students, cloud storage and computing, updated digital content, reduced printing costs, anywhere / anytime student access to the world wide web, online assessment and restructuring the technology replacement cycle.

What are you using?

According to the Winter 2013 issue of Scholastic Administrator iPads still dominate the mobile tech category. More than 8 in 10 say they are using iPads or that they plan to.

Collaborative Overview and Teamwork

A team of stakeholders should assist with creating the vision and the planning process. A project of this magnitude is too large to expect one person to implement. Typically at least one person in the organization is passionate about leading the project. The leader could be a teacher, technology director, principal or superintendent. My assumption is you are that person if you are reading this implementation guide. As the
leader, establish a “Dream Team” of student and teacher leaders that share the same enthusiasm for the project. The most successful implementations have a team of people with a vested interest working toward a common goal.

Mason County High School established a dream team for their iPad 1:1 known as the iTeam. Members of the iTeam include parents, community members, a board member, students, teachers and administrators. Collectively these individuals can produce a variety of skill sets necessary to cover all aspects of the implementation from instruction to technical assistance.

Collaboration and teamwork was a key component to the success of the Mason County High School 1:1 Implementation. Determine and delegate implementation responsibilities to your dream team. There were many stakeholders involved at MCHS including teachers, students, IT staff, administrators, parents, community, and Morehead State University’s 21st Century Education Enterprise.

Below are a few examples of the various tasks carried out by stakeholders to ensure success of the program:

- Administrators adopted policies and procedures in order to accommodate the instructional shift and influx of technology.
- The iTeam met on a regular basis to make collaborative decisions about the initiative.
- Classroom teachers collaborate within content specific areas to share lessons learned and classroom strategies by integrating technology.
- Students collaborate with peers and teachers to smooth the transition from teacher led to active student participation in the lesson. The

“Devices will change but good instruction will look the same.”

“We are not truly integrating technology unless students are using technology”
integration of Edmodo a learning management system enhanced communication between students and teachers. Offering exposure to a learning management system will help students make a smooth transition to online courses offered at post secondary institutions.

- Students gain experience by operating a student help desk modeled after Apple’s Genius Bar. At the help desk students handle technical requests and produce “how to” instructional videos for students and staff to assist with communication and training.
- Dr. John Curry along with the Morehead State University 21st Century Enterprise assisted with focus groups, student surveys, and data analysis.
- The 21st Century Education Enterprise provided professional development for teachers and administrators. The focus of the professional development was the integration of 1:1 technology in order to provide meaningful, real world, effective and engaging student instruction.

The leadership team should be on the forefront when selling the vision. Initially the vision was presented from a top down approach, which wasn’t successful. Even though the first attempt to secure funding failed it laid the groundwork for the second attempt. A collective group of teachers and student voices can be more influential than an administrator in most instances. When a goal has the backing of students, teachers and administrators then the movement is hard to resist.

Change can be difficult. This presents another reason it is imperative to build capacity then empower others during this process. Don’t get discouraged by the “it can’t be done” or “this is the way we have always done it” or “we are already doing this” mentality. Listen constructively to naysayer concerns and continue to educate others on the need for change. It is often hard for people to buy into a vision without seeing the plan in action. Exposure to conferences, professional development and school visits are great ways to expose others to new ideas. You can strengthen your school’s instructional strategy by holding true to core beliefs plus gain insight from high performing / innovative schools. The Mason County High School iTeam
attended school visits to high performing 1:1 schools with successful 1:1 implementations. The team members were able to network with colleagues and form ongoing relationships.

Below is a list of 1:1 schools MCHS visited prior to implementing their iPad 1:1:

- Greene County Schools, North Carolina
- Hancock County Schools, Kentucky
- Woodford County Schools, Kentucky

Business and Community Partnerships

It’s important to gain community and parental support throughout the iPad implementation. Make sure to include parents and community representatives on your initial planning team. Once you have your team and vision established the next step is to sell the plan to the public. Parents, students, and community members are essential to inform others about the vision and reason for change. There are local organizations in every community that team members could speak about the iPad implementation. Mason County High school team members presented at the Rotary Club, Chamber of Commerce, on the local radio station and contacted the newspaper. Mason County High School included these organizations by inviting them to hand out iPads to students during the initial roll out the first week of school. Community members were assigned to classrooms to assist teachers with the iPad distribution. Handing out iPads to students for the first time was an exciting event for our community members.

The school leadership team encouraged business and community organizations to provide Wi-Fi to their patrons. As a result of the partnership the businesses that offered Wi-Fi provide a service to students without Internet access at home. The business could also benefit by increased sales because of their valued customer service.

End User Device

The schools vision and instructional outcomes should be established before considering which instructional device to purchase. Is the intent of the instructional device to replace textbooks, access the Internet, enhance creativity, practice fluency with instructional apps or increase communication?
Once the leadership team determines the instructional goals then consider which technological instructional device is best for students and staff.

After the vision and instructional goals have been determined there are several factors when considering which device to purchase. There will not be one device that meets all your goals! You will need to prioritize which features are most important then base your purchasing decision on which device meets most of your expectations.

After careful consideration the chosen device for Mason County High School was an iPad. Why did Mason County High School choose an iPad for their 1:1 device?

**The iPad...**

- is user friendly for students and teachers
- is interactive for students of all ages
- is easily accessible to the app store with a multitude of educational apps
- allows students to access digital content and textbooks
- can be personalized for each student
- has a long battery life
- is durable and repairs are minimal
- can easily be switched out with another iPad by using with iCloud
- has a midrange price point

Cost of the device is always a factor. Make sure to select a device that your budget can sustain. The total cost of ownership needs to be considered including network infrastructure, initial cost of the device, repairs, staffing and replacement cost. During leadership team visits to 1:1 schools it was apparent that battery life was an issue for notebooks. In some of the classrooms there were extension cords plugged in everywhere and some devices would not power the full school day with one charge. Another technical aspect that stood out was the IT staff appeared to have many more technical repairs in the schools
with notebooks than the 1:1 iPad schools. There are people that will advocate strongly for a MacBook or another brand of notebook instead of an iPad. They can point out pros and cons of notebooks versus iPads. A common con is that students can’t create with an iPad. There are limitations to an iPad but as more apps surface, the ability to create on the iPad increases. Every school is different and should make the best choice based on student needs. In today’s society people use multiple devices for different functions. Some people will have an opinion about why their device is better or why you should purchase a particular new device on the market. Do not make a rush decision to purchase a new device just because it is “the flavor of the week.” Collectively consider all aspects before purchasing a device. The primary focus should be instruction rather than device driven.

Financial Considerations / Cost Analysis

The cost of providing a 1:1 instructional device for all students is one of the largest barriers. Leaders should consider the ability to sustain the cost of the 1:1 for an extended period of time, not just the initial investment. There are instances where a 1:1 has been implemented then reverted back to computer labs due to lack of funding or a change in administration that does not value technology. Mason County is not a wealthy district, however, providing technology as a resource for students is a priority.

Consider changing the traditional thought process regarding the technology replacement cycle. For instance

WHAT’S HOLDING DISTRICTS BACK?

While the benefits of mobile tech are tempting, roadblocks remain significant. Cost and poor infrastructure are the top two hurdles for districts to overcome. Respondents were asked to pick the top three problem areas by Scholastic Administrator.

Mason County High School previously had computer labs and two to four computers in the back of the classroom for student access. This is a common model for many high schools but not very effective. Imagine trying to organize a lesson to accommodate 30 students to access 2-4 computers within the same class period. Here is another scenario to consider, the school needs to administer an online test for 834 students with only 3-4 computer labs. Both of these scenarios were the case at Mason County High School. Because of the limited access to technology the testing process took three weeks to
test the entire student body. This particular diagnostic test was given three times each year which meant the computer labs and library media center were booked for 9 weeks of the entire school year! Just think of the instructional time lost and staff hours to organize and supervise such a task. After changing the replacement cycle to an iPad 1:1 MCHS cut down the testing time to only two days each testing cycle!

By changing the technology replacement from the traditional model to purchasing iPads this immediately tripled the device ratio for about the same cost. Consider the price of an iPad is nearly one third the cost of some notebooks or half the cost of desktops. To achieve a 1:1 ratio the district worked with MCHS to combine funds for the technology replacement cycle. Mason County High School pays $12,500 annually out of school allocations toward the iPad lease. The district leased the iPads for three years and MacBooks for four years. After two years of use the iPads still retain 50-60% of their original value from their initial $399 purchase price. When the lease is renewed after three years the annual cost will be considerably less with the trade in value of the original iPads. The Mason County School district lease is $225,000 annually for the entire district comprised of nearly 3,000 students. The $225,000 lease is about 1% of the district’s annual budget. In the grand scheme of the budget, 1% is a reasonable allocation to provide students access to technology. Technology replacement should be factored in the budget annually the same as other budgetary items such as replacing buses, facility maintenance, staff development, utilities and personnel.

The cost of the iPad 1:1 can be sustained by reallocating money from the traditional technology replacement cycle. Tablets are more affordable and ease of access is more efficient than limited desktops and notebooks in each classroom. The money previously spent on traditional textbooks that

“We need technology in every classroom and in every student and teacher’s hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world.”

David Warlick
become obsolete soon after their purchase is now being allocated toward digital textbooks that can be updated often. Copy and paper costs at MCHS have been reduced by nearly 32% and continue to decrease. That is a significant reduction of $12,000 based on MCHS paying $40,000 annually for printing. The money is not a true savings, however the savings from the copy cost is reallocated to pay a portion of Mason County High School’s technology lease.

The end user device is only one aspect of the financial consideration. Actually the cost of the network infrastructure will cost more than the instructional devices. Start planning the infrastructure to handle a 1:1 so you are ready when the opportunity presents itself. Mason County Schools began upgrading the network to support a 1:1 implementation five years prior to purchasing the end user devices. Network requirements and potential funding solutions are discussed in Chapter 3 the Technical Aspects of an iPad 1:1.

Another cost factor to consider is technical support. Make sure you have enough technical support staff to support the network and end user devices. A student operated help desk can assist the IT department with device management and technical repair requests. Mason County High School enables a teacher to oversee a student operated help desk for three hours each day to assist the district IT department. The students are able to gain credit and real world experience working the help desk. The help desk tracks the iPad break rate and total loss data, which is broken down in Chapter 5 - Data Results. These results are analyzed to help implement preventive measures to reduce repair costs. Students should have some financial obligation to ensure a shared ownership and proper care of the iPad. The school needs to consider student fees and decide whether to self-insure or contract out to a third party insurance provider.

**Take Home Fee / Protection Plan**

Insurance will be another consideration you will have to decide upon prior to a 1:1 implementation. Will you choose a third party insurance provider, extended warranty from the
manufacturer or self-insure? Crunch the numbers and make the decision that is best for your particular situation. Instead of insurance coverage the iTeam chose a shared responsibility between the school and students known as “The iPad Take Home Protection Plan.” Mason County High School offers a take home fee that serves as a protection plan deductible for the iPad. The iPad Take Home/Protection Plan is designed to allow students to take the device home and offset the cost of repair for accidental damage, loss or theft if needed. Any student that pays a non-refundable $40 fee will be able to take the device home. The policy and fee only cover the school issued device and does not cover personal software installed by the user. In addition to the iPad Take Home/Protection Plan fee of $40, students pay a $20 technology resource fee to offset the expense of eBooks, content-specific Apps and other relevant electronic resources.

Fees are assessed for lost or damaged iPads. The $40 fee is be deducted from the price of any damage ONLY for the first incident per year. Day users will be responsible for the full price of repair / replacement. For more information about the iPad Take Home Protection Plan or to view the detailed fee schedule click on the link below.

iPad Take Home Protection Plan

Consider starting with a 1:1 classroom set or BYOD model

There is not a one size fits all implementation of a 1:1 instructional device. Some schools may have an opportunity to implement a 1:1 more quickly than others. Many schools have to start small because of financial constraints. Regardless, the best chance of accomplishing the goal is to get started. If the school can’t initially provide a 1:1 implementation start with a classroom set of iPads or Bring Your Own Device (BYOD). You
may be thinking isn’t a BYOD a 1:1 implementation within its self? Technically yes, assuming all the students can afford to purchase their own instructional device or Smartphone. Mason County High School has a 62% free / reduced lunch ratio. Only half of the high school students own a Smartphone. Mason County High School chose to provide iPads for every student because it levels the playing field for all students. As good as a BYOD initiative is the program still fosters the “have and have nots” in certain situations. However, in some schools a BYOD may be the best solution. The primary objective is to provide ease of access to technology for all students and a BYOD supports that goal.

Mason County High School started with a classroom set of iPod touches in 2007. At the time the district was entirely a PC district. The classroom set of iPod’s were self contained that had to be synced and charged on a cart. Approximately 30 students per class during a seven period day shared the devices. At the time the school only had blanket wireless coverage in areas of the school so we attached an access point to the mobile cart. There were obstacles with sharing, syncing, and other technical aspects but the potential was unlimited. Students were engaged in videos, digital content, limited apps, access to the World Wide Web (WWW) and formative assessment opportunities. By 2010 the iPod pilot project led to four classroom sets of iPads simulating a 1:1 environment in each school. The pockets of success from the mobile carts led to an iPad 1:1 implementation of 834 students in 2012. Can you see how a snowball effect is possible?

Policy and Procedures

The school administration must consider implementation strategies along with policy and procedures to support the iPad 1:1 initiative. Stakeholders at Mason County High School created the documents below to serve as guidelines for parents, teachers and students:
• iPad 1:1 Brochure - Frequently Asked Questions

• iPad Handbook

• MCHS iPad Quick Reference Guide

• iPad Take Home Protection Plan

• Acceptable Use Policy

Communication is key for an effective roll out. The leadership team was bombarded with questions after the news on an iPad 1:1 initiative. Team members were responding to the same questions repeatedly from different individuals; therefore, the group compiled answers to the most common questions in the form of a brochure. The frequently asked questions (FAQ) brochure was a good time saver and communication tool. The FAQ brochure addressed questions such as cost, cases, procedures and other requirements. This brochure was completed by a group of teacher leaders on the iTech and district administrators within the Mason County School system. Click on the link below to view the Mason County High School Frequently Asked Questions Brochure.

iPad 1:1 Brochure - Frequently Asked Questions

iPad Handbook

The iPad Handbook is a document created to serve as an overview for basic guidelines and procedures. The handbook is beneficial for parents, students, and teachers to follow as a guideline for the bulleted list of items below:

• Check-In / Check-Out - Protection plan, digital drivers license, day user versus take home and accessories.

“Any growth requires a temporary loss of security.”

Madeline Hunter
**Usage Guidelines** - Acceptable use policy, securing your device and syncing to iCloud.

**iPad Care** - Recommended iPad proper care.

**iPad Case and Screen Care** - Case requirements and screen protection.

**Damage/Loss** - Technical procedures and iPad loaner.

**Personalization** - Personalization guidelines, passcode lock, personal app installation, music and email.

**Instructional Use** - Instructional focus, charging and updates.

iPad Handbook

**iPad 1:1 Classroom Management Quick Reference Guide**

The iPad 1:1 Classroom Management Quick Reference Guide was created at the request of Mason County High School teachers. At the end of the first year iPad 1:1 reflection some of the teachers requested a discipline code of conduct specific to the iPad in the classroom. However, the administration decided to handle iPad discipline issues the same as they would any other classroom disruption. The device is not the root cause of the problem. There are teachers that have demonstrated successful classroom management routines and procedures while integrating the iPad. Two teacher members of the iTeam, Robbie Kimble and Maggie Prater, took on the task of compiling these tried and true routines and procedures and creating a classroom management guide for the staff. Click on the link below to view suggested “Dos and Don’ts” using the iPad in the classroom:

**MCHS iPad Quick Reference Guide**
(Created by Robbie Kimble and Maggie Prater)

**iPad Roll Out - Day User or Take Home User**

Students with iPads are classified into two categories referred to as a “Day User” or “Take Home User”. Take home users have the opportunity to take home an iPad throughout the
school year. Take home users are required to sign a user agreement, acceptable use policy, pay the $40 take home fee and complete the Digital Drivers License. There are a few students that choose not to take the iPad home. Out of 834 iPads deployed the day users fluctuate around 50 that pick the iPads up of the morning then turn them in at the end of the school day. The day users fluctuate because of repairs or students not fulfilling the user agreement. The day user numbers decrease then stabilize as the year goes on due to the fact that more students complete the Digital Drivers License and student fees are paid.

Make every effort to allow students that have met the requirements to take the iPads home the first day of school because of charging. Students received iPads during the first week of school. Teachers collected fees, user agreements and allowed students to work on their Digital Drivers License during homeroom. The first year MCHS overlooked the magnitude of the charging process. Collecting and charging iPads the first week was labor intensive because there were over 300 day users which resulted in collecting and charging over 300 iPads after school then distributing the following morning. The students couldn’t become a take home user until they completed the Digital Drivers License and fees were paid. The day user number dwindled slowly each day as the students met the requirements. The number of day users soon leveled off to approximately 50 students out of 834.

The second year of the iPad deployment MCHS created a registration process enabling parents and students to pay fees, complete required forms and ensure the Digital Drivers License was complete before the first day of school. Allowing students to pick up iPads prior to school alleviated the workload during the first week of school on teachers, administrators and the IT staff. The registration was a weeklong process with separate days for freshman, sophomores, juniors and seniors to pay fees, sign the user agreement, acceptable user policy and verify the Digital Drivers License. A fifth day was offered to anyone that could not make the designated day with his or her group. The registration process reduced the amount of day users significantly the first week of school. Looking at the third year of deployment we will give all 8th graders a chance to complete the Digital Drivers License in middle school or over summer break before their freshman year.

In order to extend learning beyond the school day we encourage students to take home the devices. However, there are some students that choose to be a day user. One of the school leaders meets individually with the day users to make sure there are no barriers to prevent them from taking home the iPad. Primarily the school leaders do not want finances to be an obstacle for any student to take home the device. Individuals and local business have sponsored some student iPad take home fees. The school also works with students on a flexible payment plan. Another reason some students elect to be a day user is that they already have access to their own personal device at home.

The student operated help desk checks out the iPads every morning for the day users then collects them at the end of the
school. The iPads are returned to the central location, scanned in using a bar coding system for tracking (similar to a library book), then they are strategically stored in a charging station until the next morning.

**iPad Cases**

Prior to distributing iPads to students make sure you have protective cases. Cases are an upfront cost that will save money over time. Make sure to research which case is best for student needs. Mason County Schools chose a mid range iPad case in terms of cost. The majority of the cases will last three years for the students that take care of them. One aspect overlooked was the case MCHS purchased failed to protect the corners of the iPad. Even though the iPad screen was protected the corners were exposed. When an iPad is dropped on one of the corners pressure on the screen can result in a cracked screen. MCHS encountered 105 cracked screens the first year of implementation out of 834 iPads deployed. That is nearly 8 percent of the total allocation with cracked screens. The cost analysis of the iPad Cases is discussed in more detail in Chapter 5. Purchasing a case with protective corners would have drastically reduced the total amount of cracked screens that would have saved money over a three year period.

**Digital Citizenship**

Mason County High School requires every student to successfully complete his or her Digital Drivers License (DDL) before taking home an iPad. The Digital Drivers License takes users through the key elements of digital citizenship. The Digital Learning Design Lab led by Mary Park and Dr. Gerry Swan created the DDL. Marty Park is the Chief Digital Officer with the Kentucky Department of Education. Dr. Gerry Swan is an assistant professor of Instructional Technology at the University of Kentucky. Listed below are the DDL core cases:

**Digital Drivers License**

- Digital Access, Health & Wellness
- Digital Commerce
- Digital Communications / Etiquette / Security
- Digital Media Fluency
- Digital Rights & Responsibilities
- The License

For more information about the Digital Drivers License visit iDrivedigital.com. Make sure to click on the How To’s and Frequent Asked Questions link at the top of the page and the About tab for more information. There is also an app available once you set up an account at iDrivedigital.com. Below is the link plus an excerpt from the iTunes store about the app:

iDriveDigital - App available at the Apple iTunes Store

Digital Drivers License App

“The DDL app is a companion app for iDriveDigital.com and the Digital Driver’s License (DDL). This is a P20 innovation project with the Digital Learning Design Lab (DL2) at the University of Kentucky’s College of Education. iDriveDigital.com helps expose users (students & teachers) to content focused on valuable digital citizenship skills and concepts. Users are also assessed on base levels of understanding. You must create an account before using the content shared in this app.

Classroom teachers, school and district administrators are invited to get started using the iDriveDigital.com website and companion app, to help engage in conversations with students dealing with appropriate online behaviors as well as run reports to check for successful understanding.”

Timeline of Events

The following charts reflect a timeline of events from 2007 through the current iPad 1:1 implementation. The charts include a broad overview during the planning and implementation stage. Most line items required detailed planning and work from various stakeholders.
### Timeline - 2007-2011

<table>
<thead>
<tr>
<th>Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
</tr>
<tr>
<td>Selling the 1:1 vision - top down (unsuccessful)</td>
</tr>
<tr>
<td>Network infrastructure - wireless, fiber optics, electrical, servers, etc...</td>
</tr>
<tr>
<td>School visits</td>
</tr>
<tr>
<td>IT department technical training</td>
</tr>
<tr>
<td>Classroom set of devices to pilot a simulated 1:1 environment</td>
</tr>
<tr>
<td>Gather capacity among leadership and teachers &quot;train the trainer&quot; model</td>
</tr>
<tr>
<td>Selling the 1:1 vision - bottom up (successful)</td>
</tr>
<tr>
<td>Determine an technological instructional device</td>
</tr>
<tr>
<td>MacBook pilot program</td>
</tr>
<tr>
<td>Restructure the technology replacement cycle</td>
</tr>
<tr>
<td>Cost analysis</td>
</tr>
<tr>
<td>Present to the Board of Ed the vision for funding</td>
</tr>
<tr>
<td>Lease process</td>
</tr>
<tr>
<td>Consultation with Kentucky Department of Education</td>
</tr>
<tr>
<td>Increased bandwidth to 100MB</td>
</tr>
</tbody>
</table>

### Timeline - 2012-2013

<table>
<thead>
<tr>
<th>Established teacher leadership team (iTeam)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student operated help desk - rollout and daily operations</td>
</tr>
<tr>
<td>Morehead State collaboration - Instructional professional development</td>
</tr>
<tr>
<td>Develop policy and procedures</td>
</tr>
<tr>
<td>Digital citizenship for students - Digital Drivers License</td>
</tr>
<tr>
<td>Acceptable use policy</td>
</tr>
<tr>
<td>Public relations - media - speak at Rotary &amp; Chamber</td>
</tr>
<tr>
<td>Rollout process</td>
</tr>
<tr>
<td>Layered sync approach</td>
</tr>
<tr>
<td>Content filtering</td>
</tr>
<tr>
<td>Learning management system (LMS) Blackboard / Edmodo</td>
</tr>
<tr>
<td>Mobile device management system</td>
</tr>
<tr>
<td>Changing instruction to integrate technology</td>
</tr>
<tr>
<td>Established an IRB</td>
</tr>
<tr>
<td>Administered MSQL in Fall and Spring</td>
</tr>
<tr>
<td>Conducted quarterly teacher interviews</td>
</tr>
<tr>
<td>Student focus groups - quarterly</td>
</tr>
<tr>
<td>Improve implementation based on student and teacher feedback</td>
</tr>
</tbody>
</table>

### Timeline - 2013-2014

<table>
<thead>
<tr>
<th>Continue data collection process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview teachers (quarterly)</td>
</tr>
<tr>
<td>Conduct student focus groups (quarterly)</td>
</tr>
<tr>
<td>Administer MSLQ survey to students (semi-annual)</td>
</tr>
<tr>
<td>Present findings at national and state conferences</td>
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<tr>
<td>Make instructional improvements based on data</td>
</tr>
<tr>
<td>Encourage &quot;meaningful&quot; instructional uses of 1:1 technology</td>
</tr>
<tr>
<td>Content specific teacher training with Morehead State University</td>
</tr>
<tr>
<td>Digital content distribution - iTunes U, iBooks, &amp; digital textbooks</td>
</tr>
<tr>
<td>Take advantage of Media Center for communication and college prep</td>
</tr>
<tr>
<td>Offer online courses</td>
</tr>
<tr>
<td>Take advantage of 1:1 for assessments</td>
</tr>
<tr>
<td>Encourage immediate feedback with technology integration</td>
</tr>
<tr>
<td>Increased Bandwidth from 100 MB to 250 MB</td>
</tr>
</tbody>
</table>
Instructional Components

One of the most important aspects when implementing an iPad 1:1 is the instructional focus. Professional development should be conducted for staff in line with the school’s vision. Changing instruction to next generation learning is an important part of integrating iPads into the classroom. Don’t expect increased student achievement by cramming an iPad into the classroom without changing instruction. Simply adding technology to the classroom will not change instruction. Training teachers how to operate an iPad is only one aspect of professional development. Professional development should primarily be focused on technology integration. Listed below are professional development recommendations that are discussed in Chapter 3:

- Next Generation Learning
- Delivery of Instruction
- Content Delivery
- iPad Resources and Educational Apps

“The principal goal of education is to create men and women who are capable of doing new things, not simply repeating what other generations have done.”

Jean Piaget
Key Instructional Elements for and iPad 1:1 Integration

INSTRUCTIONAL COMPONENTS

1. Professional Development / Next Generation Learning

2. Delivery of Instruction - Project Based Learning, Flipped Classroom Model and Blended Learning

3. Content Delivery - Online Diagnostic Assessment, Web 2.0 Tools, Digital Textbooks / Content and Learning Management Systems

4. iPad Resources and Educational Apps

Professional Development / Next Generation Learning

Professional development strategies need to be revamped providing teachers with resources and training to prepare students. Students should be engaged while the teachers delegaRete allowing the students to actually do the work. Collaboration is a key component enabling teachers to plan together and work together (Bellanca & Brandt, 2010). In order to meet student needs teachers should give up some control in the classroom. Students need the flexibility to be creative and collaborate.

Incorporating project based learning and community based learning can be great ways to engage kids.

In Tony Wagner’s book, The Global Achievement Gap he points out the gap between what our best schools are teaching versus the skills to be successful in the workforce, college and as citizens. Wagner interviewed hundreds of business people to come up with the seven survival skills for the 21st Century. Those seven “Survival Skills” include:

- Critical thinking and problem solving
• Collaboration and leadership
• Agility and adaptability
• Initiative and entrepreneurialism
• Effective oral and written communication
• Accessing and analyzing information
• Curiosity and imagination

Throughout the chapters of *The Global Achievement Gap* Wagner addressed the “Old World of School” based on passive learning to closing the achievement gap. We need to move away from the current model that rewards both memorization and a focus on test preparation. Wagner noted that tests rarely require students to apply their learning and almost never require students to exhibit proficiency in higher forms of cognition. According to Wagner (2010), the most important overachieving academic skills are writing and research. To be the most successful in college he suggests the following habits of mind: intellectual openness, inquisitiveness, analysis, reasoning, argumentation and proof, precision and accuracy, and problem solving.

Wagner suggests the need to reinvent the education profession. He believes existing professional development and evaluation systems are inadequate. According to Wagner (2010), we need to use technology to motivate today’s student and tomorrow’s workers. Although he admits everything kids do with technology is not positive. Finally, to close the achievement gap the author gives examples of some schools that work. A couple of these schools are High Tech High and MET. To succeed these schools refuse to teach to the test, and academic content is provided through interdisciplinary projects and personalized learning rather than stand-alone courses. “Instead of having students take classes and maybe

“The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.”

*Bill Gates*
eventually figuring out what their interests are, we start with helping every student to find their interest and then build a learning plan around it.” (Wagner 2010)

21st Century Education Enterprise

Mason County High School formed a partnership with Morehead State University's 21st Century Education Enterprise prior to the iPad implementation. Twenty-First Century Education Enterprise (TCEE) focuses on project-based learning techniques and promotes the use of technology in the classroom, professional development, and educational leadership to improve teacher effectiveness and to better engage today's students. To succeed in today's global economy, Kentucky students must gain necessary skills in communications, critical thinking, and technology.

21st Century Education Enterprise

• Classroom Technology Innovations
• Professional Development
• Educational Leadership

The 21st Century Education Enterprise collaborated with Mason County High School's iTeam to develop a professional development plan. Krista Barton and Dr. John Curry, members of the 21st Century Education Enterprise from Morehead State University, were instrumental during the planning, training and rollout of the iPads.

The 21st Century Education Enterprise professional development focused on alleviating teacher apprehension toward the iPad 1:1 then reinforced the vision and need for next generation learning. The initial MCHS iPad professional development focused on a broad overview of the iPads. Teachers were given iPads and received professional development in May prior to the students receiving iPads at the beginning of school. The initial training and early distribution provided staff an opportunity to use the iPads over summer that helped teachers feel at ease with the device. Prior to school
starting in August the 21st Century Education Enterprise Team conducted technology integration professional development. This training consisted of a broad overview of instructional tools that all teachers could use to integrate technology into the classroom. Some of the Web 2.0 tools included Google Drive, Edmodo as an online learning management system, and apps such as Evernote for note taking. The third professional development session provided more content specific training and individualized instruction. Teachers were provided time to collaborate within departments to work on a lesson integrating iPads into the classroom. The work session was invaluable because the 21st Education Enterprise provided support as needed while allowing teachers to guide the lesson.

As the school year progressed Dr. Curry, Krista Barton, MSU staff and myself conducted student and teacher focus groups. The student focus groups consisted of a random student sampling grades 9-12. During the process we observed that students shared out more openly with peers in their same grade level. As a result we interviewed students in groups of four divided into grades 9, 10, 11 and 12. The findings from student and teacher focus groups are discussed in the Data Results Chapter 5.

Once Mason County High School teachers felt more comfortable integrating iPads the 21st Century Education Enterprise introduced project-based learning. During the second semester the Morehead State University team introduced the benefit of providing real world authentic lessons using the iPads as a tool.

**Next Generation Learning Academy**

Building upon the foundation established during the first year of professional development there was a major shift the following year to transform the high school experience. A leadership team of teachers and administrators participated in the Next Generation Leadership Academy (NxGL). The Next Generation Leadership Academy (NxGL Academy) takes school leaders who know the system needs to change and helps them work through implementation of innovative ideas. The academy is a yearlong study to redefine systems of learning to support...
next generation learning. Participants have joined a virtual support network to share resources, ideas and support for innovation practices that improve college and career readiness.

During the interactive sessions the MCHS NxGL team heard from Terry Holliday, Kentucky Department of Education Commissioner; Tom Vander Ark, author of Getting Smart: How Digital Learning is Changing the World and CEO of Getting Smart, a learning advocacy firm; UK College of Education faculty members Linda France, John Nash, Justin Bathan, Wayne Lewis, Eve Proffitt, Jayson Richardson, Laurie Henry and Nick Sauers; UK College of Education Dean, Mary John O’Hair; and Kentucky school leaders, Janet Granada, Carmen Coleman and Buddy Berry.

The NxGL leadership team attended school visits in Kentucky and Ohio. Below are three of the schools that model next generation learning:

- **Metro High School** is located in Columbus, Ohio. Some students graduate in two years and some take four years. Learning and transition are based on mastery.
- **Elkhorn Crossing, Georgetown, KY**
  Elkhorn Crossing focuses on high level, project-based, engaging curriculum offered in Engineering, Biomedical Sciences, Health Science, Media Arts and Law & Justice Villages.
- **Reynoldsburg City Schools, Ohio** - Reynoldsburg transformed its large high school into four college/career academies, each aligned to clusters of careers including eSTEM, Encore, HS2 and Bell.
  1. **eSTEM** - Environmental Science, Technology, Engineering & Math.
  4. **Encore** - Art, Communication & Design.
Delivery of Instruction

The iPad integration and exposure to next generation learning provided a spark to redesign instruction at Mason County High School. The leadership team members generated, prioritized, and merged the following ideas that best serve their stated purpose:

- **Innovative Scheduling**
- **Implement Project Based Learning / Project Lead the Way**
- **Offer Career Clusters / Villages**
- **Redefine Response to Intervention Class (RTI)**
- **Enhance Middle College Opportunities**

Click on the link to view the detailed compression planning report created by the MCHS NxGL Leadership Team - Redesigning Student Learning Experiences at Mason County High School. The district plans to transform an existing facility into a STEAM Academy - Science, Technology, Engineering, Agriculture and Medical. Plans are underway to participate in Project Lead The Way (PLTW) supported by the Bill and Melinda Gates Foundation.

**Project Lead The Way**

Mason County High School will implement Project Lead The Way to provide additional career pathways for students. Project Lead The Way (PLTW) is the leading provider of rigorous and innovative Science, Technology, Engineering, and Mathematics (STEM) education curricular programs used in elementary, middle, and high schools across the U.S.

STEM education is at the heart of today’s high-tech, high-skill global economy. For America to remain economically competitive, our next generation of leaders -- the students of today -- must develop the critical-reasoning and problem-solving skills that will help make them the most productive in the world.

STEM education programs like the one offered by PLTW engage students in activities-, projects-, and problem-based
(APPB) learning, which provides hands-on classroom experiences. Students create, design, build, discover, collaborate and solve problems while applying what they learn in math and science. They are also exposed to STEM fields through professionals from local industries who supplement the real-world aspect of the curriculum through mentorships and workplace experiences.

The Getting Started Guide provides information on each of PLTW’s three programs:

- Gateway To Technology (GTT) -- middle schools
- Pathway To Engineering (PTE) -- high schools
- Biomedical Sciences Program (BMS) -- high schools

The education staff at Apple pioneered its own version of project-based learning known as Challenge-Based Learning (CBL). The CBL approach focuses on increasing student engagement. CBL is a collaborative learning experience in which teachers and students work together to learn about compelling issues, propose solutions to real problems, and take action. The approach asks students to reflect on their learning and the impact of their actions, and publish their solutions to a worldwide audience. Following are the six steps when implementing CBL in the classroom:

Challenge Based Learning - Apple Education

- The Big Idea
- Essential Questions

The Six Design Principles of the 21st Century High School

- The Challenge
- Guiding Questions and Activities
- Guiding Resources
- Solutions and Presentations

According to Apple Classrooms of Tomorrow (ACOT2, 2008), readily available technology along with a multidisciplinary approach to instruction will enhance teaching and learning. Apple Classrooms of Tomorrow -- Today is a collaborative effort with the education community to identify the
essential design principles for the 21st century high school by focusing on the relationships that matter most: those between students, teachers, and curriculum. ACOT² has identified six design principles for the 21st century high school:

**The Six Design Principles of the 21st Century High School**

- Understanding of 21st Century Skills and Outcomes
- Relevant and Applied Curriculum
- Informative Assessment
- A Culture of Innovation and Creativity
- Social and Emotional Connections with Students
- Ubiquitous Access to Technology

**Blended Learning**

Access to iPads provides blended learning opportunities for students at Mason County High School. Blended learning refers to any time a student learns, at least in part, at a brick and mortar facility and through online delivery with student control over time, place, path, or pace. For example, a student experiencing blended learning takes classes in a traditional school building with a designated instructor and also takes courses online remotely. The Mason County Board of Education revised the district policy regarding seat time to accommodate flexible student learning opportunities. Students at Mason County High School use ODYSSEYWARE, Morehead State University, Maysville Community College, and iTunes University for blended eLearning solutions. Clayton Christian predicts by 2019, fifty percent of all high school courses will be delivered online.

Blended Learning can be grouped into six distinct models that vary by teacher roles, physical space, delivery methods, and scheduling. However, as new versions of blended learning are developed, the relationships between these models will evolve. Presented below is a preliminary classification of the blended learning models currently in use.
Another form of blended Learning implemented at MCHS is the “Flipped Classroom” concept. A Flipped Classroom is a form of blended learning in which students learn new content online by watching video lectures, usually at home, and what used to be homework (assigned problems) is now done in class with teacher offering more personalized guidance and interaction with students, instead of lecturing. A veteran math teacher at Mason County High School was first to flip her classroom. The iPads along with apps like Educreations or ShowMe enable the teacher to record her instruction then the students watch the lesson at home. Instead of lecturing during class, now she has time to assist students during class. The flipped classroom is great for reteaching since students can watch the video multiple times until comprehension. Another advantage of a flipped math classroom is the teacher can assist students having difficulty with problems during class instead of students getting stuck at home.

Below is a list of model schools that currently offer a blending learning environment:
Blended Learning Environments

- High Tech High, CA
- School of One, NY
- Jeffers, Las Vegas
- Cornerstone, Detroit
- Summit Denali, CA
- High Tech High, CA
- Carpe Diem, AZ
- Rocky Mount, NC
- eSTEM, OH
- Career Path High, UT
- Bracken STEAM, NV
- DSST

Scott McLeod posted an article online at Dangerous Irrelevant - Technology, Leadership, and the Future of Schools stating 3 Big Shifts in education. Below are the three big shifts he indicated including how these shifts have impacted Mason County High School.

- **From Low-Level Thinking to High-Level Thinking.** From an overwhelming emphasis on students doing lower-level thinking tasks (factual recall, procedural regurgitation) to students more often engaging in tasks of greater cognitive complexity (creativity, critical thinking, problem solving, collaboration, effective communication). **MCHS examples - Project based / challenge based learning, Project Lead the Way, Lync, Edmodo, collaborative work space, wikis, blogs, web pages, drop boxes, and other shared online documents.**

- **From Analog to Digital.** From local classrooms that are largely based on pens/pencils, notebook paper, ring binders, and printed textbooks to local and global learning spaces that are deeply and richly technology-infused (devices + Internet). **MCHS examples - iPad 1:1 integration, digital textbooks, iTunes University and Web 2.0 tools.**

- **From Teacher-Directed to Student-Directed.** From classrooms that are overwhelmingly teacher-controlled to learning environments that enable greater student agency (ownership and control of what, how, when, where, who with,
and why they learn). **MCHS examples - Project Lead the Way, Blended Learning, Flipped Classrooms and eLearning with ODYSSEWARE.**

**Content Delivery**

As a result of the iPad 1:1 implementation MCHS was able to embark on a new approach to content delivery from Analog to Digital. Students and teachers are able to use Web 2.0 tools in the classroom to enhance instruction. Digital content is accessible on the iPad such as interactive textbooks. Online testing is now a possibility for student diagnostic assessment. Learning Management Systems help students communicate and collaborate beyond the typical school day. Below are some examples of digital content implemented at Mason County High School as a result of the iPad 1:1 integration.

- **Edmodo** is a learning management system. Edmodo is a free and safe way for students and teachers to connect and collaborate.
- **eChalk** brings all your learning and communication tools into one place including 24/7 email, professional website, classroom web tools, online groups and dedicated project manager.
- **College Equipped Readiness Tool (CERT)** for the ACT, is easy to administer and aligned with the latest version of the College Readiness Standards.
- **eBackPack** is based on the fundamental principles of safety, control, and ease of use while providing a collaborative environment supporting assignment management, announcements, and file storage.
- **OverDrive** is the leading full-service digital distributor of eBooks, audiobooks, music and video worldwide. OverDrive provides instant

“Teachers need to integrate technology seamlessly into the curriculum instead of viewing it as an add-on, an afterthought, or an event.”

Heidi-Hayes Jacobs, Educational Consultant
eBook access, one-step checkout and integration with library discovery tools.

- **Digital Textbooks - Browse iBooks Textbooks**

- **ODYSSEYWARE** is an online eLearning solution used in more than 2,500 school districts; ODYSSEYWARE includes courses in the core subjects of history and geography, math, language arts, and science, as well as a variety of electives.

- **iBooks Author** is an amazing application that allows anyone to create beautiful iBooks textbooks — and a variety of other books — for iPad and Mac. (This iPad Integration Guide was created with iBooks Author)

- **iTunes University** gives educators an easy way to design complete courses with audio, video, and other content and distribute them through the iTunes U app. **Mason County Schools iTunes University**

- **iCloud** lets you access your music, photos, documents, and more from any device you are using.

- **Office 365** enables MCHS students to access email, OneDrive for Cloud storage, and Lync video conferencing on the iPad.

Reflecting on the initial iPad 1:1 integration at Mason County High School more digital resources should have been provided up front for both teachers and students. However, it takes time build a resource toolkit. Resources such as digital textbooks, online programs, and apps help teachers make a smooth transition from the traditional classroom. Ideally, as teachers become more comfortable with integrating an iPad into their lessons instruction will move from content delivery to students creating content.

**iPad Resources and Educational Apps**

There are so many apps available for an iPad that it can be overwhelming to decide which apps are best for the classroom. Frances Judd shared, via TeachThought, four questions to ask yourself before choosing educational apps.

**4 Questions To Ask Yourself Before Choosing Educational Apps:**
• What will the child learn from the app?
• Does the app offer the child an opportunity to practice a skill needed in school?
• Does the app motivate a child to transfer that learning into the real world?
• What conversation and collaboration will the app inspire?

**Apple in Education Resources**

Apple Education provides a plethora of recommended apps and resources for education. APPitic is a directory of apps for education by Apple Distinguished Educators (ADEs) to help transform teaching and learning. These apps have been tested in a variety of different grade levels, instructional strategies and classroom settings. Listed below are additional resources and apps compiled by Apple:

• Apple in Education - Apps for Learning Collections
• Apple in Education - App Store Education Category
• iPad in Education
• App Store Collection for Every Grade
• Apple in Education - Resources

Apple Education is just one of the many avenues to find educational apps and resources. Below are iPad educational resources provided by 21st Century Fluency, Edutopia, Mind/Shift, Getting Smart and TeachThought:

• 36 Core Teacher Apps For Inquiry Learning With iPads

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“Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is most important.”

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**Bill Gates**
• 12 Smart iPad Apps For Collaborative Learning
• The 55 Best Free Education Apps For iPad
• 8 Educational (and Fun) iOS Games for Teens
• Creativity on the Run: 18 Apps that Support the Creative Process
• Eight Great Apps for Educators to Create, Display and Share

“The factory model of education is the wrong model for the 21st century. Today, our schools must prepare all students for college and careers - and do far more to personalize instruction and employ the smart use of technology.”

Arne Duncan, U.S. Secretary of Education
"You forgot to load my apps!"
“We don’t have a technology initiative, we have a learning initiative”

Unknown

An insufficient network infrastructure is one hurdle that districts have to overcome prior to an iPad 1:1 implementation. This chapter covers network infrastructure requirements and potential funding for internal connections. A high-speed network with sufficient bandwidth is essential to provide cloud-based instruction for end users. A robust network is only one aspect to consider from a technical standpoint. Listed below are iPad 1:1 technical aspects discussed throughout this chapter:

- Cloud Based Computing
- Network Infrastructure
- Deployment and Mobile Device Management
- Technical Assistance
- Next Generation Classroom Equipment
CHAPTER 4
Deploying an iPad 1:1

TECHNICAL ASPECTS

1. Cloud Based Computing in an iPad 1:1 environment
2. Network Infrastructure - Wide Area Network, Local Area Network, Wifi, High Speed Network, and Erate Funding
3. Deployment and Mobile Device Management
4. Technical Assistance - Student Operated Help Desk
5. Next generation classroom equipment - projector, interactive white board, Apple TV, sound system, etc.

Cloud Based Computing

When planning an iPad 1:1 the network must be robust enough to handle user needs. Users must have instructional devices and Internet Access in order to benefit from Cloud based instruction. In today’s environment the majority of programs are moving toward cloud based. Cloud computing delivered as a service to other companies and individual software developers is a relatively new phenomenon. Cloud based solution companies all offer slightly different solutions, but ultimately they all promise to host and run applications on shared computing infrastructure.

Cloud computing comes into focus when you think about what IT always needs: A way to increase capacity or add capabilities without investing in new infrastructure, training new personnel, or licensing new software. Cloud computing encompasses any subscription-based or pay-per-use service that, in real time over the Internet, extends IT’s existing capabilities.

WARNING

This chapter contains technical jargon that may bore a non tech person!
A few years ago the Mason County Schools IT department spent countless hours configuring personal computers specifically for multiple users. This was a labor-intensive process, taking into account that software installation, configuration and customization for each user is unique. Cloud based computing provides an opportunity to switch out end user devices with minimal setup while retaining personal settings. Software does not have to be installed for Cloud based programs. The user simply logs in with a specific user ID and password anywhere with Internet access. If a particular software does not support Cloud based computing make sure the server or client based software is device agnostic. Device agnostic refers to software or data that has been designed to work across a range of devices rather than just one platform.

The iPad 1:1 at Mason County High School enables teachers and students the opportunity to take advantage of the Cloud based solutions below.

- **Storage / backup** - Dropbox, Apple iCloud and SkyDrive
- **Software / Productivity** - Office 365 including Email and Lync
- **Assessment** - Measures of Academic Progress (MAP) and College Equipped Readiness Tool (CERT) the College Equipped Readiness Tool for the ACT, is easy to administer and aligned with the latest version of the College Readiness Standards
- **Finance Management Software** - MUNIS

- **Learning Management Systems** - Edmodo and eBackpack
- **IT Help Desk Software** - Web Help Desk
- **eLearning** - ODYSSEYWARE and iTunes University
- **Student Information System** - Infinite Campus

**Apple iCloud**

Apple iCloud enables students to access their music, photos, documents, store contacts, calendars, books, apps and more from their iPad. Students create an Apple ID login they
use for just about everything they do with Apple, including using iCloud to store content, downloading apps from the App Store, and buying songs, movies, and TV shows from the iTunes Store. iCloud can share files between multiple devices. If for some reason a student needs a replacement iPad their profile and content can be downloaded using iCloud.

Apple iCloud

Wide Area Network (WAN)

The Kentucky Department of Education (KDE) provides the Wide Area Network (WAN) for Kentucky school districts. The Wide Area Network Service offers statewide IP data communications connectivity. The WAN service connects districts to each other, to state agencies, and to the Internet. In 2011, the traffic capacity KDE provided to Mason County Schools was 25 megabytes (MB) up and down. Prior to the iPad 1:1 the traffic capacity was sufficient to meet the district needs. Mason County Schools’ maximum inbound traffic was 9.97 MB and 10.16 MB for the outbound traffic. See the Mason County Traffic graphical representation from August 8th, 2011 through December 3rd, 2011(Figure 1). Keep in mind the inbound and outbound traffic during school is actually higher than the graphs show because the data factors off peak times when school is not in session.

During the planning stage of the 1:1 implementation the Kentucky Department of Education (KDE) increased Mason County Schools’ traffic capacity to 100 MB. In 2012, after the
iPad 1:1 implementation Mason County School traffic significantly increased. See the Mason County Schools traffic graphical representation from August 3rd, 2012 through December 3rd, 2012 (Figure 2). After the implementing 834 iPads at MCHS the districts maximum inbound traffic soared to 88.52 MB and 20.56 MB outbound. Throughout all four schools Mason County currently has over 1,400 iPads district wide accessing the network.

On December 4th, 2013 KDE increased Mason County Schools’ maximum traffic capacity to 250 MB. The traffic increase was a relief because of the sheer number of devices and increased end user needs for Cloud based computing. See the Mason County Schools Traffic graphical representation from August 16th, 2013 through December 17th, 2013 (Figure 3). The districts maximum in bound traffic average was 97.21 MB and 14.04 MB outbound. Since the increase to 250 MB on December 4th the maximum outbound traffic is 124.40 MB.

Local Area Network (LAN)

The Local Area Network (LAN) should have a robust Wi-Fi and wired infrastructure to handle internal traffic. The Mason County School Districts LAN is connected with 10-gigabit (GB) fiber between all sites. The Main Distribution Frame (MDF) and Independent Distribution Frame (IDF) are connected by gigabit fiber. The MDF is the main computer room where servers, switches, routers, etc. reside. The MDF room provides space for wall-mounted and rack mounted equipment supporting the centrally administered communications systems, as well as the point-of-presence for local phone and cable companies. The IDF is a remote room or closet connected to the MDF by fiber optic cable. In the IDF expect to find switches and patch panels. The switches in the IDF provide gigabit to the desktop with CAT 5 and 6 cabling for the end users that opt to use a data port instead of Wi-Fi.

Wi-Fi

Mason County High School installed blanket Wi-Fi coverage strategically placed in hallways and common areas in 2008. Blanket Wi-Fi is not enough coverage to hand an iPad 1:1
implementation. There should be at least one wireless access point in every classroom to handle students accessing Cloud based programs or streaming media. In 2010, every classroom at Mason County High School was equipped with an access point to prepare for a mobile device 1:1 implementation. Student Internet traffic is restricted to 2MB up and down over the Wi-Fi. Teachers have unrestricted Wi-Fi traffic capacity, unrestricted traffic equates to about 350MB per access point. The total capacity for one access point is 350MB. The traffic is shared up to 350MB between the devices accessing the wireless access point. For instance, a classroom of thirty students with iPads shares the bandwidth on one wireless access point.

Another aspect of the Wi-Fi integration includes an Enterasys PODnet for registration, tracking and secure, differentiated access for of mobile devices.

**Enterasys PODnet**

- Protects the school network while providing appropriate access to applications and the Internet.
- Effectively balances security and availability for personal devices use.
- Proactively controls access and bandwidth utilization for all devices on the network.
- Simplifies the management of BYOT, iPad or 1:1 deployments.

- Provides network-based support for success with Digital Driver’s License programs.

Recently twelve Mason County school buses were equipped with Wi-Fi. The intention of installing Wi-Fi on the school buses was to provide students an opportunity to complete homework while traveling to and from school. In rural areas students may spend an hour each way on the school bus. Extracurricular activities and student athletes also benefit from Wi-Fi on the school buses. Some scheduled events during the week take hours of travel time after school and students may not return home until late at night.

The school bus Wi-Fi uses an AT&T Cradlepoint to provide 4G LTE Internet Access. The Cradlepoint is configured to access the nearest cellular tower through a Virtual Private Network (VPN) at AT&T’s data center. The VPN goes to Mason County School’s content filtering solution then follows the same path back to the end user. The reason school bus Internet traffic was directed “around the world then back” is to make sure the student Internet searches go through the school districts content filtering appliance.

**Content Filtering**

Congress enacted the Children’s Internet Protection Act (CIPA) in 2000 to address concerns about children’s access to obscene or harmful content over the Internet. CIPA imposes certain requirements on schools that receive discounts for Internet access or internal connections through the E-rate program. The protection measures must block or filter Internet access to pictures that are: (a) obscene; (b) child pornography;
or (c) harmful to minors (for computers that are accessed by minors). Schools subjected to CIPA have two additional certification requirements: 1) their Internet safety policies must include monitoring the online activities of minors; and 2) as required by the Protecting Children in the 21st Century Act, they must provide for educating minors about appropriate online behavior, including interacting with other individuals on social networking websites and in chat rooms, plus cyber bullying awareness.

E-rate Funding

One source of funding to pursue for network infrastructure is USAC Schools and Libraries - E-RATE. E-rate provides federal funding for Telecommunications and Internet Access that is categorized as priority one services. Priority two funding includes Internal Connections. Only certain products and services, used in specific ways, are eligible for E-rate funds. Eligibility is based on poverty levels determined by student free and reduced lunch status.

Mason County Schools was fortunate to receive 1.3 million in E-rate federal funds for Internal Connections in 2007-2008. The funding was used to purchase E-rate eligible network infrastructure items such as cabling, core router, switches, and Wi-Fi. The district funding level based on students free and reduced lunch status is 80 percent. Out of fourteen years applying for E-rate Internal connections the funding commitment only dropped to the 80 percent level two times. The second time funding was approved in 2009-2010 the district received $800,000. The funding was allocated to upgrade eligible equipment and provide Wi-Fi for every classroom in the Mason County School system. Without the combined E-rate funding commitments exceeding 2 million dollars the district would not have been able to afford the high-speed network. The Mason County Board of Education committed to pay the remaining 20 percent of the funding commitments with E-rate paying the other 80 percent.

Deployment

The leadership team should determine an iPad 1:1 management approach. Below are some guiding questions that will help determine the schools mobile device management style:
• How much control is the school willing to give up to the students?
• Who will own the apps purchased under which Apple ID, the school or student?
• How will syncing apps and updates take place?
• Will students be allowed to personalize the device?

These considerations can be difficult questions to answer because management styles vary between individuals and schools. There are primarily three approaches to managing iPads:

• School Controlled
• Student Controlled
• Layered Sync Approach

School Controlled iPad Management

The school can maintain complete control of the device by locking down the iPads so only approved apps can be installed by school staff. Students would not have the ability to personalize the iPad with apps, music, videos, etc. In order to setup a school owned account an Apple ID would be created to sync multiple devices under one user name. There are pros and cons to each management approach. One advantage to the school controlled iPad management approach is limiting student gaming on apps. However, with access to the Internet online games are still be available.

The main con to the school controlled iPad management approach is the labor involved. Consider installing or updating one app on 834 iPads. Sure, the students could approve the update but not without compromising the school owned Apple ID. Installing apps and updates requires password authentication using the Apple ID that the students would not have access to. Therefore, any app or update that needed installed would have to be performed by a school appointed staff member.
Student Controlled Management Approach

Another iPad 1:1 management approach is student-controlled management of the iPad. This management style entrusts students with the responsibility of managing their own device. Students setup their personal Apple ID on the iPad enabling them to download apps and updates at their discretion.

The advantage to the student controlled iPad approach is the workload of downloading new apps and installing updates is distributed over multiple users. This is a significant time saver for schools with a limited IT staff. Another benefit is students can download apps immediately at the teacher request. A teacher can ask the students on short notice to download a particular app for class without having to wait on the IT department or school designee to perform the task. Instant access to downloading apps makes the iPad more suitable for the classroom environment. Students are more likely to feel empowered by the iPad if they are able to personalize the device with music, apps and videos. Personalizing the iPad reduces the necessity for students to carry multiple devices.

A con to the student controlled management approach is some students will not be able to handle the freedom. Students may fill up the storage with personal music, videos, non-instructional apps or content. A school policy should be implemented that requires priority of storage toward instructional content over personal content. The policy can be hard to enforce with multiple students and no control of the device.

Another disadvantage to the student controlled iPad management approach is content ownership. When a school purchases an app through Apple’s Volume Purchase Program the student retains ownership because the student Apple ID is the account that downloads the app. When the student graduates the app will go with the student account.
Layered Sync Approach

A third iPad 1:1 management technique is a shared responsibility between students and school staff referred to as the Layered Sync Approach. The layered sync approach consists of two Apple ID’s assigned to each iPad; one school owned Apple ID and one student owned Apple ID. The Mason County High School leadership team selected the layered sync approach to manage the high school’s iPad 1:1. MCHS created a school owned Apple ID then setup a standard configuration on student iPads. The layered sync approach provides the district control during the initial configuration to restrict access for inappropriate content or explicit material. Common apps are installed during the initial configuration. The school owns the apps and has the responsibility of maintaining the updates for only those apps.

After initial configuration of the iPads the school Apple ID should be logged out so the student can log in using his or her personal Apple ID. The layered sync approach takes advantage of the iPads ability to run multiple Apple IDs on one account. This process is possible because iCloud stores the user’s content available for download specific to the user’s Apple ID. MCHS students can personalize the iPad with their Apple ID basically on top of the school owned Apple ID. Students can download apps and digital content in real time. The shared responsibility of the layered sync approach provides the best of both worlds from a management perspective. Students have the flexibility to personalize the iPad while the school still maintains some control of the content.

There are pros and cons to consider before deciding which approach better suits your school’s mobile device management style. So which method is best for your school? The answer boils down to what is best for students and manageable for staff. Listed below are three schools with successful iPad 1:1 implementations each using a different management approach:

- **School Controlled** - Hancock County High School, KY
- **Student Controlled** - Woodford County High School, KY
- **Layered Sync Approach** - Mason County High School, KY
Mobile Device Management (MDM)

A Mobile Device Management (MDM) solution can assist with the daily operations of a large iPad deployment. There are several companies to research before purchasing an MDM solution. The three companies Mason County Schools considered were Absolute Manage, AirWatch and Casper Suite. Our IT team decided to purchase Absolute Manage to assist with Mason County High School’s iPad 1:1. The reason for purchasing an MDM was to assist with configuration, app deployment, updates, restrictions and GPS tracking of the devices. The IT team was disappointed with the software implementation because the particular MDM didn’t meet expectations. One of the major disappointments was the inability to track lost or stolen iPads because of a change to Apples iOS. Apple no longer allows third party MDM solutions to track iPads. The school has the ability track iPads to an extent with Apple’s Find my iPhone App. Currently the IT team is researching replacing the MDM solution with Casper Suite. Casper Suite appears to be more focused toward the education environment. Caper Suite offers a solution called Casper Focus specifically geared toward the education environment.

According to the Casper Suite website when iPads arrived in the classroom they brought a fun, engaging, interactive learning experience to teachers and students. But as the use of iPad in education continues to grow, teachers sometimes find it hard to keep students focused on learning and often must resort to hovering over students to make sure they are not surfing the web or playing games.

With Casper Focus, distractions are no longer an issue and hovering is a thing of the past. With just a couple taps, teachers can command the attention of their classroom by controlling exactly what each student sees on their device. And because Casper Focus uses network segments to enable or disable teacher control depending the location of the device, students have free reign over their iPad when they are not on the school’s network.
With Casper Focus, teachers can perform classroom management tasks while preserving the magic of iPad. They can do this independently, from their own iPad—without assistance from the IT department.

- Focus students on a single app.
- Guide classes through apps, helping students to focus on classroom instruction.
- Temporarily switch to a locked app, gaining students' attention and saving valuable class time.
- Utilize single-app mode, giving teachers the ability to guide individuals, subsets of students, or all students at once.
- Display device screens on the classroom's designated Apple TV, giving educators a simple option to either display their own device or prompt a student to display their device.
- Search, view, and suggest reading material from the iBookstore, making eBooks available to all students in their class.
- Ensure access to a student's iPad if the student forgets their passcode or locks the teacher out.
- Perform secure assessments in both formative and summative situations.

**Apple Configurator**

iOS devices can be configured for enterprise deployment using a wide variety of tools and methods. End users can set up devices manually with a few simple instructions from IT, or device setup can be automated using Configuration Profiles or a third-party Mobile Device Management (MDM) server.

In some deployments, an IT department may want to mass configure a set of devices with the same settings and apps before the devices are placed in the hands of end users. This is often the case when different people use the same device throughout the day. Other deployments require that the devices be tightly managed and reset to a specific configuration on a regular basis.
Apple Configurator makes it easy to mass configure and deploy iPhones and iPads in situations like these by enabling three simple options:

- **Prepare devices.** You can prepare a set of new iOS devices with a single central configuration, and then deploy them to users. Update devices to the latest version of iOS, install Configuration Profiles and apps, enroll them with your organization’s MDM server, and then hand them out. Preparing devices is a great deployment option when your organization wants to provide iOS devices to employees for their day-to-day use.

- **Supervise devices.** Another option is to supervise a set of iOS devices that remain in your direct control and can be configured on an ongoing basis. Apply a configuration to each device, then reapply it automatically after each use just by reconnecting the device to Apple Configurator. Supervision is ideal for deploying devices for dedicated tasks (for example, retail, field service, medical), sharing devices among students in a classroom or a lab, or temporarily loaning iOS devices to customers (for example, hotels, restaurants, hospitals).

- **Assign devices.** Lastly, you can assign supervised devices to specific users in your organization. Check out a device to a specific user and restore that user’s backup (including all of their data) to the device. When the device is checked back in, back up the user’s data for later use—even on a different device. This option works well when users need to work with the same data.

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**Volume Purchase Program**

The Apple Volume Purchase Program (VPP) makes it simple for schools to find, buy, and distribute apps and books. Schools that participate in the Volume Purchase Program (VPP) can choose between two different distribution methods for each VPP transaction: managed distribution or redeemable codes.

With managed distribution, organizations retain ownership and control of apps purchased through VPP. They can assign apps and books to users and groups through a mobile device.
management (MDM) solution, and they can revoke and reassign the apps as needed. After they assign books, the user retains ownership of the books.

Alternatively, organizations can use redemption codes to transfer ownership of apps or books to the user's iTunes account, or they can use redemption codes with Apple Configurator to distribute apps to devices using Apple Configurator.

Volume Purchase Program: Migrating from redemption codes to managed distribution

iPad Charging and Syncing Apps

Charging and syncing iPads can be two of the most labor-intensive aspects of an iPad 1:1 depending on the school’s management philosophy. Shared responsibility of the iPad makes for a manageable deployment. Student “Take Home Users” are responsible for bringing the iPad to school charged. Make a mental note that “Day User” iPads have to be charged by school staff each night. The more students that are day users the longer it takes to collect, charge and distribute iPads each day. If for no other reason than from a management perspective make every effort for students to meet the take home requirements prior to the first day of school. If not, there will be hundreds of iPads the school staff has to charge nightly at least the first week. The picture in Figure 4 is a collection of several hundred iPads at MCHS. Do you think charging that many iPads would be a daunting task?

Technical Assistance / Student Operated Help Desk

The Mason County School District IT staff is comprised of one network manager and one technician responsible for nearly 3,000 users. Mason County High School created a student operated help desk modeled after Apple’s Genius Bar. A teacher at MCHS manages the student help desk for half of the school day. The initial help desk team of students deployed over 1,200 iPads for the district. According to the Forbes list this was the 82nd largest deployment in the world in 2012. The help desk students set up the base configuration on the iPads using Apple Configurator, train students and teachers, handle routine
technical requests, hand out and collect day user iPads and create “How To” instructional videos.

This year, a Tech Support Day was implemented near the start of school to assist MCHS students with technical issues. The tech support day was created to alleviate the high volume of technical requests during the beginning of school. There were six-support stations set up in the high school library media center. Below are the six categories.

- **Station 1**: Password Reset & E-mail
- **Station 2**: APP Store and Apple ID
- **Station 3**: Online Assessment Software
- **Station 4**: Student Information System
- **Station 5**: Digital Content Download and Apps Support
- **Station 6**: Cloud Storage

A team of tech staff and students were assigned to individual stations. Students in need of technical assistance could stop by the library media center at designated times during the school day. The times were staggered by grade level. For instance, “Any 9th grade student with a last name starting with A-M may report to the library media center if he or she needs technical assistance.” The students had the opportunity to visit one or more stations to assist with technical issues.

### 21st Century Classrooms

Mason County High School is equipped with 21st Century Classrooms. Every classroom contains a sound system, Smart Board, Projector and Apple TV. There are different variations and brands of Intelligent Classrooms. Some schools purchase large screen televisions instead of projectors, other schools purchase a different brand of interactive white board. A 21st Century Classroom can engage a large number of students controlled by a single device such as a notebook or iPad. Prior the iPad 1:1 at MCHS classrooms were equipped with docking
stations. Now by using the iPad camera the teacher or student can project anything to the projector instead of using a document camera. The Apple TV allows teachers and students to mirror their iPad display on the projector. Apple TV requires an HDMI projector in order to mirror the display. Mirroring an iPad display using Apple TV is a great way to show student work in the classroom and for teachers to demo a lesson.

Mason County High School 21st Century Classroom Model

- iPad
- Projection System
- Interactive White Board
- Sound System
- Apple TV

“New technology is common, new thinking is rare.”

Sir Peter Blake
Chapter 5

Data Results

The Data Results Chapter of this case study documents the impact of Mason County High Schools 1:1 iPad integration accompanied with next generation teaching techniques. The effect of the iPad 1:1 integration on student engagement, teaching and learning is examined through a mixed method data collection process:

- Data Analysis Method and Local Context
- iPad Focus Groups
- Student Engagement - MSLQ Survey Results
- Achievement - Behavior, Attendance and MCHS School Report Card
- Cost Analysis - Break Rate and Copy Count

“Kids don’t care how much you know because Google knows more.”

Eric Jensen
CHAPTER 5

What Does The Data Say?

**QUANTITATIVE AND QUALITATIVE DATA**

1. Data Analysis Method and Local Context including Free / Reduced Lunch Ratio and District Demographics

2. iPad Focus Groups - Student and Teacher

3. Student Engagement - MSLQ Survey Results

4. Achievement - Behavior, Attendance and MCHS School Report Card

5. Cost Analysis - Break Rate and Copy Count

**Mixed Method Data Analysis**

The impact of this case study was evaluated by qualitative and quantitative data analysis. Qualitative data analysis includes student and teacher focus groups, walk-throughs and observation. Quantitative data analysis includes attendance, ACT, college and career readiness, behavior, dropout rate and the Motivated Strategies for Learning Questionnaire (MSLQ)

**Local Context / Limitations**

The case study is limited to data from students in grades 9-12 attending Mason County High School. Only schools with similar make up should generalize the results from the data. Mason County High School is located in rural Maysville, Kentucky with an estimated county population of 17,512 in 2012. Mason County High School is one of four schools within the Mason County School District. The district has a total of 2,706 students excluding preschool. Enrollment at Mason County High School remains consistent with 834 students grades 9-12. Sixty-two percent of the student population is free or reduced lunch and 9 percent are minority. According to the Census Bureau the estimated median household income from 2007-2011 was $40,678.
Mason County High School
Free and Reduced Lunch Percentage

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<th>REDUCED</th>
<th>ENROLLMENT</th>
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**Student Focus Groups**

If you really want to know what is working in your school and what is not, ask the students! Students will often tell you the truth even if the truth is hard to hear. Be prepared to hear some criticism but don’t take it personally. Use student and teacher feedback constructively to help improve your program.

Dr. Curry, Krista Barton, Rachel Blackwell and myself conducted student and teacher focus groups. The student focus groups consisted of a random student sampling grades 9-12. During the interviews students shared out more openly with peers in the same grade level. As a result we interviewed students in groups of four from grades 9, 10, 11 and 12. Dr. Curry led the student focus group discussions because he has a natural ability to establish a rapport with students. Students seemed to feel at ease during the questioning. The first question Dr. Curry asked each group is, “If you could rank the iPad implementation at MCHS 1-10 what would it be?” The answers varied for each student. On average students ranked the iPad 1:1 integration a 7.

Even though today’s students are born digital natives that does not mean they will all embrace technology. Some students interviewed did not understand the importance of being exposed to technology if they did not plan on attending college. The high school needs to make a conscious effort to inform students the benefits of exposure to technology. During the focus groups, student perception was that anything wrong with technology was the iPad’s fault. For instance, if the network was slow or particular software had issues the problems were associated with the iPad.

All students appreciated the ease of access to technology. Students recognized the fact that 24 / 7 iPad access increased student and teacher communication via email, messaging, social media and Edmodo. Note taking apps such as Evernote, Popplet and Notes Plus were common apps used by numerous students. Students found the opportunity to save and organize notes with the iPad beneficial. The notes could easily be organized to review for exams later in the semester. In some instances if a teacher posted notes on the white board students would simply take a photo of the board rather than copying notes during the lecture. Students appreciated the fact they could participate during class discussion rather than trying to take notes.

During the focus group discussion students shared their appreciation that content on iPad’s replaced heavy book bags
previously filled with books. Digital content on the iPads also saves time during class changes since students do not have to go to their locker as often to switch out books. Several classes at MCHS have digital textbooks which are much more interactive than a standard textbook. Students mentioned the benefits of the Overdrive app available through the MCHS Library Media Center. Overdrive allows students to browse eBooks and audiobooks available, check them out online, enjoy them digitally on the iPads, then the material is automatically returned after 14 days. Immediate access to the Internet was another benefit of the iPads that students acknowledged during the focus groups. Students are able to conduct research, Google questions, watch instructional videos from sources like the Kahn Academy and access Web 2.0 resources.

Dr. Curry asked students how they cheat in school with an iPad? Students were not hesitant to share how to cheat with an iPad. Some examples of cheating were taking screen shots of answers then sharing via email with other students. Students can also text message answers to each other. Many students search the Internet for answers to questions they didn’t know. Is searching the Internet cheating if a student takes advantage of the ability to look up an answer? Researching answers to a question in the workplace is common so why not embrace this type of activity?

Classroom distraction was a concern voiced in both teacher and student focus groups due to students gaming on the iPad. Gaming can be a distraction for students that cannot handle the freedom during class. Students shared that their classmates who are gaming now are the same students that were disengaged in class prior to the iPads. Students were appreciative that their gaming classmates are less of a classroom disruption now.

The fight against gaming is an uphill battle. The best fight against gaming is effective classroom management and an engaging lesson. Teachers that make sure students are on task by walking around the classroom facilitating the lesson experience minimal discipline problems. Notice the key word
discipline problems, not iPad problems. Some people blame the device for student actions rather than students taking ownership for their behavior. MCHS is currently researching Casper Focus a MDM solution to help teachers minimize student gaming.

Teacher focus groups

Rachel Blackwell with Morehead State University’s 21st Century Education Enterprise conducted teacher focus groups. Ms. Blackwell asked the same questions and recorded the audio of teacher interviews. The questions focused primarily on what teachers like and dislike the most regarding the iPad 1:1 integration. Teacher responses are interesting and beneficial for making improvements moving forward with the iPad 1:1. All of the teachers interviewed in year two say that if given the choice to continue the iPad 1:1 implementation or return to their original classrooms, they would choose to keep the iPads.

The following paragraphs summarize teacher feedback from the focus groups. Teachers love the ability for students to have research at their fingertips. When primary resources are needed, the iPad makes these resources easily accessible. The iPad is an instant source of information. The communication factor between students and teachers has increased incredibly.

Teachers do not like the fact that some students do not take their iPads home, and that not everyone has Internet access outside of school. For those who do have access, the ability for teachers and students to communicate outside of school is beneficial. Teachers understand that the number of day users is not something the school can control, but think their classroom would function more efficiently if all students were take home users.

Day-to-day activities have changed in several ways since the implementation of the iPads. Teachers feel the students are able to do more work that is individualized in addition to pairing activities. There is more access to research and increased writing in the classroom. There is a reduction of copies. The iPad is used more as a tool with teachers and this has allowed them to do more with technology. Rather than being textbook oriented, the class has changed into more of an information directed study.

Classroom distraction and gaming was the most common complaint from the teacher perspective. Teachers believe that the same students that were distracted previously, are still the ones distracted after the iPad 1:1 implementation. Many teachers have taken on the philosophy that upper grade students (juniors and seniors) choosing to use their iPad for activities other than assigned work, are aware that they will not receive credit in the classroom for making that choice. Teachers have noted that students are easily frustrated when technology does not work.

Mason County High School Teachers shared their favorite content specific apps. Edmodo was one of the favorite apps because of the Cloud based program’s similarity to Facebook,
safety, and ease-of-use. Teachers use Edmodo as a platform for student make up assignments, interventions, remediation and enrichment. Content specific and note taking apps received high remarks from teachers. Popplet is one of apps used for note taking and curriculum framework.

**Motivated Strategies for Learning Questionnaire (MSLQ)**

The Motivated Strategies Learning Questionnaire (MSLQ) is an instrument that examines several aspects of motivation related to learning. The MSLQ was designed by researchers as a measurement instrument to investigate the nature of student motivation and learning strategy use. Instructors and students also use it as a means of assessing students' motivation and study skills. The MSLQ instrument usually takes approximately 20-30 minutes to complete.

Fifty-two questions from the MSLQ relevant to student motivation and engagement were targeted for the student survey. The library media specialist at Mason County High School administers the MSLQ at the beginning of the school year then again toward the end of the school year. In 2012, all students took the MSLQ but due to difficulties matching student results less than one hundred surveys could be compared. The results showed a slight decline in student motivation. There are many variables that impact student motivation and learning. Was the decline because of the iPad 1:1 implementation or was it the difference between student attitudes from the start of school and the end of school?

The Fox photo was sketched on an iPad by MCHS Sophomore Art student Jarrett Coyle.

Mason County High School continues to administer the MSLQ semiannually while Dr. Curry tracks the results for the 2013-2014 school year. After matching individual student responses from fall to spring Dr. Curry analyzes the results of each question. In 2013, a narrower test group of random students was targeted. Two hundred and thirteen students were randomly selected to take the MSLQ. This student group was required to include their student ID along with first and last name to assist with matching up the start of year data to the end of year results. The MSLQ questions are not specific to iPads but
the MSLQ’s reliability and validity are more accurate than creating generic questions. Click on the link to view the modified MSLQ questionnaire containing 52 questions and student responses from fall 2013 - MCHS MSLQ Fall 2013 Results

Achievement - Mason County High School Accountability Data

This section takes an in-depth look at Mason County High School’s comparison data prior to the iPad 1:1 and the measurement effect following the iPad 1:1 Integration. Mason County High School student achievement increased in all areas except for two based on the Kentucky school accountability model. Figure 1 represents a snapshot of Mason County High School’s accountability results.

![Figure 1](image-url)

<table>
<thead>
<tr>
<th>Accountability Measure Snapshot</th>
<th>Increase / Decrease</th>
<th>2011-2012</th>
<th>2012-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Increase / Decrease</td>
<td>2011-2012</td>
<td>2012-2013</td>
</tr>
<tr>
<td>10th Grade ACT Plan Scores</td>
<td>Increase</td>
<td>16.5</td>
<td>16.7</td>
</tr>
<tr>
<td>ACT Composite</td>
<td>Increase</td>
<td>18.5</td>
<td>18.9</td>
</tr>
<tr>
<td>Next Generation Learners</td>
<td>Increase / Decrease</td>
<td>2011-2012</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Accountability Performance</td>
<td>Increase</td>
<td>55.6</td>
<td>57.2</td>
</tr>
<tr>
<td>Schools Percentile Rank</td>
<td>Decrease</td>
<td>58</td>
<td>62</td>
</tr>
<tr>
<td>Growth</td>
<td>Increase</td>
<td>57.2</td>
<td>58</td>
</tr>
<tr>
<td>College / Career Readiness</td>
<td>Increase</td>
<td>41.8</td>
<td>62.8</td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>Increase</td>
<td>85.5</td>
<td>90.8</td>
</tr>
<tr>
<td>Achievement</td>
<td>Decrease</td>
<td>66.3</td>
<td>52.6</td>
</tr>
<tr>
<td>Gap</td>
<td>Decrease</td>
<td>27.2</td>
<td>24.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AMO Goal</th>
<th>Overall Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Measurable Objective</td>
<td>Met Goal</td>
</tr>
<tr>
<td>Rewards and Assistance Category</td>
<td>Progressing</td>
</tr>
</tbody>
</table>
Based on data from Mason County High Schools report card there was not an iPad 1:1 implementation dip regarding student achievement. The overall school accountability performance index increased from 55.6 to 57.2. Consequently the high school’s percentile ranking in Kentucky increased from 58 to 62. ACT composite and Plan scores also increased. Mason County High School remains a Needs Improvement school but moved into the Progressing Category. In order to be considered a proficient school MCHS needs to score in the 70th percentile. Mason County High School is considered a progressing school because they met the Annual Measurable Objective (AMO), participation rate for the all students group and subgroup, and has met their graduation rate goal. Figure 2 is a breakdown of the classification list from the Kentucky Department of Education.

### Mason County High School Academic Performance

#### 2011-2012 Compared to 2012-2013

<table>
<thead>
<tr>
<th>Accountability Performance</th>
<th>Year</th>
<th>Overall Score</th>
<th>Percentile in Kentucky</th>
<th>Classification</th>
<th>Rewards and Assistance Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>2012-2013</td>
<td>57.2</td>
<td>62</td>
<td>Needs Improvement</td>
<td>Progressing</td>
</tr>
<tr>
<td></td>
<td>2011-2012</td>
<td>55.6</td>
<td>58</td>
<td>Needs Improvement</td>
<td></td>
</tr>
</tbody>
</table>

### Mason County High School Annual Measurable Objective (AMO)

<table>
<thead>
<tr>
<th>Annual Measurable Objective (AMO)</th>
<th>Year</th>
<th>Prior Year Overall Score</th>
<th>AMO Goal</th>
<th>Overall Score</th>
<th>Met AMO Goal</th>
<th>Met Participation Rate Goal</th>
<th>Met Graduation Rate Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>2012-2013</td>
<td>55.6</td>
<td>56.6</td>
<td>57.2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Mason County High School ACT scores

Mason County High School’s ACT Composition Mean Score increased from 18.5 in 2011-2012 to 18.9 in 2012-2013. This increased Mason County High Schools rank in the state from 114 to 103. The chart below depicts the ACT overall score between the two school years.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ACT COMPOSITE MEAN SCORE</th>
<th>STATE RANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>18.9</td>
<td>103</td>
</tr>
<tr>
<td>2012</td>
<td>18.5</td>
<td>114</td>
</tr>
</tbody>
</table>

2013 Mason County High School PLAN Scores 10th Grade

Mason County High School’s 10th grade PLAN Scores increased from 16.5 in 2011-2012 to 16.7 in 2012-2013. Mason County High School remains below the National PLAN Composite score average of 17.2. The chart below depicts the composite PLAN score between the two school years.

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Math</th>
<th>Reading</th>
<th>Science</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation 2013</td>
<td>16.2</td>
<td>17.6</td>
<td>16.7</td>
<td>17.8</td>
<td>17.2</td>
</tr>
<tr>
<td>MCHS 2013</td>
<td>15.9</td>
<td>16.4</td>
<td>16.2</td>
<td>17.8</td>
<td>16.7</td>
</tr>
<tr>
<td>MCHS 2012</td>
<td>15.6</td>
<td>16.7</td>
<td>15.9</td>
<td>17.3</td>
<td>16.5</td>
</tr>
</tbody>
</table>

Next-Generation Learners (NxGL)

Next-Generation Learners is one of three components of Kentucky’s accountability system. The component includes multiple measures of student performance on tests, graduation, and readiness for college or career. Reporting is organized into five categories: Achievement, Gap, Growth, College/Career Readiness and Graduation Rate. Mason County High School increased from the 2011-2012 school year in the areas of Growth, College / Career Readiness and Graduation Rate. MCHS declined in the component areas of Achievement and Gap. The table below shows the comparison between the
2011-2012 and 2012-2013 school years. For more detailed academic data click on the Mason County High School Report Card link courtesy of the Kentucky Department of Education.

<table>
<thead>
<tr>
<th><strong>Next Generation Learners</strong></th>
<th><strong>Achievement</strong></th>
<th><strong>Gap</strong></th>
<th><strong>Growth</strong></th>
<th><strong>College / Career Readiness</strong></th>
<th><strong>Graduation Rate</strong></th>
<th><strong>Total</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mason County High School</td>
<td>Points</td>
<td>Weighted Score</td>
<td>Points</td>
<td>Weighted Score</td>
<td>Points</td>
<td>Weighted Score</td>
</tr>
<tr>
<td>2012-2013</td>
<td>52.6</td>
<td>10.5</td>
<td>24.2</td>
<td>4.8</td>
<td>58.0</td>
<td>11.6</td>
</tr>
<tr>
<td>2011-2012</td>
<td>66.3</td>
<td>13.3</td>
<td>27.2</td>
<td>5.4</td>
<td>57.2</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Kentucky School Accountability Model

For a better understanding how the effectiveness of Mason County High School is determined it is important to gain an understanding of Kentucky’s school accountability model. Kentucky’s Unbridled Learning System is based on multiple measures of school effectiveness. The measures fall into three major categories – Next-Generation Learners, Next-Generation Instructional Programs and Support, and Next-Generation Professionals. See Figure 4

<table>
<thead>
<tr>
<th><strong>Next-Generation Learners (included 2011-12)</strong></th>
<th><strong>Next-Generation Instructional Programs and Support (included 2012-13)</strong></th>
<th><strong>Next-Generation Professionals (included 2014-15)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>Gap</td>
<td>Growth</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Program Reviews:</td>
<td>• Arts and Humanities</td>
<td>• Practical Living/Career Studies</td>
</tr>
<tr>
<td>Program Reviews:</td>
<td>• Arts and Humanities</td>
<td>• Practical Living/Career Studies</td>
</tr>
</tbody>
</table>
Scores for the various measures and components are weighted and tallied to produce an overall accountability score from 0 to 100. To encourage continuous improvement, each school and district will have an annual goal to reach—an annual measurable objective (AMO)—based on how much improvement is needed to reach the ultimate goal of 100. Schools and districts also will have goals to reach in achievement, gap reduction, college/career readiness and graduation rate. Data for these areas will be publicly reported each year, and any weaknesses must be targeted for improvement.

Overall district scores are ranked in order; overall school scores are ranked in order by level—elementary, middle and high. Based on where they are in the order, schools and districts will fall into one of three main classifications:

- Distinguished - the top 10 percent of districts or schools from a particular level (90th percentile)
- Proficient - in the top 30 percent of districts or schools from a particular level (70th percentile)
- Needs Improvement - schools/districts falling outside of the Proficient or Distinguished categories and not meeting their AMOs (at or below the 69th percentile)
- Progressing - school/district has met its AMO, participation rate for the all students group and each subgroup, and has met its graduation rate goal

**Rewards and Assistance Category**

- School/District of Distinction scores from the 95th to 99th percentile, has met its current year AMO, meets student participation rate and the graduation rate is above 60. In addition, the school/district cannot be labeled as Priority or Focus.

- High Performing School/District scores from the 90th to the 94th percentile in the state, has met its current year AMO, meets student participation rate and the graduation rate is above 60. In addition, the school/district cannot be labeled as Priority or Focus.

- High Progress School/District has met its current year AMO, participation rate and graduation rate, has a graduation rate above 60 for the prior two years and has an improvement score indicating the school/district is in the top 10 percent of improvement.

- Progressing School/District has met its AMO, participation rate for the all students group and each subgroup, and has met its graduation rate goal.

- Priority School is a school that was identified as a Persistently Low Achieving (PLA) school.

- Focus School has a non-duplicated gap group score in the bottom 10% of the state, has an individual group of students scoring significantly low or has a graduation rate less than 60 for two consecutive years. Focus schools were identified based on the 2011-12 data and the label of Focus has been carried forward into the 2012-13 reporting.
Focus District has a non-duplicated gap group score in the bottom 10% for all districts. Focus districts are identified based on data annually. Current identification is based on 2012-13 data.

A Parent’s Guide to School Accountability in Kentucky

Break Rate Data / iPad Cases

Cracked iPad screens were a recurring issue based on the MCHS 2012-2013 school year break rate data. Out of 834 iPads deployed, 105 screens were cracked which equates to 12.59 percent. The cost to repair a cracked screen on an iPad is $100 each. One of the iPad 1:1 lessons learned at MCHS was to purchase a more secure case upfront. Buying a robust case initially would have saved a significant amount of time and money by preventing damages. The original case MCHS bought did not protect the corners of the iPad. Although the case had a cover that protected the screen the corners of the device should be protected as well. When an iPad was dropped and landed on the corner pressure could crack the screen. The break rate goal at MCHS was to stay below 6 percent that could have been achieved with the proper case.

When it is time to refresh the iPad cases MCHS will spend more to purchase a more robust case. Even though a durable case will cost more money upfront the investment will save the school and students money over time. A durable case will likely reduce cracked iPad screens by fifty percent. Fifty percent fewer cracked screens is a significant savings over three years. The iPad cases were bought with the intention of lasting the entire three-year term of the iPad lease agreement. Approximately 25 percent of the cases will need to be replaced after the second year of use. Student care makes a significant difference in the longevity of an iPad case. Originally Mason County High School spent $24.21 per iPad case. MCHS could spend $35 for a durable case the next refresh cycle and still save approximately $12,000 dollars over three years. The savings is a direct result of not having to replace 25 percent of the cases after two years and cutting the cost of cracked screens by fifty percent.

<table>
<thead>
<tr>
<th>Number of iPad's Deployed</th>
<th>834</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cracked Screens</td>
<td>105</td>
</tr>
<tr>
<td>Break Rate Percentage</td>
<td>12.59%</td>
</tr>
<tr>
<td>Monetary Value</td>
<td>$10,500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of iPad's Deployed</th>
<th>834</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdrew Students</td>
<td>7</td>
</tr>
<tr>
<td>Damaged Beyond Repair</td>
<td>5</td>
</tr>
<tr>
<td>Lost / Stolen</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
</tr>
<tr>
<td>Break Rate Percentage</td>
<td>2.04%</td>
</tr>
<tr>
<td>Monetary Value</td>
<td>$6,783</td>
</tr>
</tbody>
</table>

Total Repair Expense       | $17,283 |
The iPad total loss numbers for lost, stolen or broken beyond repair was only 2.04 percent of the 634 iPad originally deployed. There were 17 total replacement iPads at a cost of $399 each for a total of $6,783 dollars. Seven students withdrew from school without turning in their iPad. The MCHS counselors are working on preventive measures for students withdrawing from school without turning in their iPad. Five iPads were damaged beyond repair for various reasons. There were five iPads lost or stolen that could not be recovered. The school filed police reports for iPads not returned or stolen.

- 7 - Students withdrew from school without turning in the iPad
- 5 - iPads damaged beyond repair
- 5 - iPads lost or stolen
- 17 Total

Mason County High School Copy Cost Reduction

The annual copy count decreased 32 percent at Mason County High School after the iPad 1:1. The reduction of copy cost is a significant savings. Previously MCHS spent approximately 40 percent of the school’s budget on copy costs. The annual MCHS Site Based Decision Making Council allocation is an average of $100,000. The 32 percent savings of $12,800 enables them to reallocate that money for the iPad 1:1.

Mason County High School Paper Reduction

The savings on paper cost is an added benefit to help offset the cost for the instructional devices. MCHS printed 333,915 less copies in the 2012-2013 school year than in the year prior to integrating iPads for every student. Calculating paper expense at .01 cent per page is an additional savings of $3,339.15. Combining the copy cost and paper usage savings is a combined savings of $16,139.15 annually. Based on preliminary data for the 2013-2014 school year copy counts continue to decrease significantly as teachers implement other methods of delivering instruction. The copy count is down 71.29% in the same quarter from June through October in 2013-2014 as compared to the 2011-2012 school year prior to the iPad 1:1.
## Mason County High School
### 2011-2012 Copy Count

<table>
<thead>
<tr>
<th>Year 2011-2012</th>
<th>B/W</th>
<th>Color</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/10/2011 - 10/9/2011</td>
<td>280,239</td>
<td>8,882</td>
<td>289,121</td>
</tr>
<tr>
<td>10/10/2011 - 1/9/2012</td>
<td>260,438</td>
<td>22,131</td>
<td>282,569</td>
</tr>
<tr>
<td>1/10/2012 - 4/9/2012</td>
<td>182,449</td>
<td>27,919</td>
<td>210,368</td>
</tr>
<tr>
<td>4/10/2012 - 7/9/12</td>
<td>251,362</td>
<td>12,533</td>
<td>263,895</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>974,488</td>
<td>71,465</td>
<td>1,045,953</td>
</tr>
</tbody>
</table>

## Mason County High School
### 2012-2013 Copy Count Comparison

<table>
<thead>
<tr>
<th>Year 2012-2013</th>
<th>B/W</th>
<th>Color</th>
<th>Total</th>
<th>Difference</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/10/2012 - 10/9/2012</td>
<td>207,732</td>
<td>19,138</td>
<td>226,870</td>
<td>-62,251</td>
<td>-21.53%</td>
</tr>
<tr>
<td>10/1/2012 - 12/31/2012</td>
<td>130,166</td>
<td>8,128</td>
<td>138,294</td>
<td>-144,275</td>
<td>-51.06%</td>
</tr>
<tr>
<td>1/1/2013 - 3/31/2013</td>
<td>108,037</td>
<td>11,925</td>
<td>119,962</td>
<td>-90,406</td>
<td>-42.98%</td>
</tr>
<tr>
<td>4/1/2013 - 6/30/2013</td>
<td>206,200</td>
<td>20,712</td>
<td>226,912</td>
<td>-36,983</td>
<td>-14.01%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>652,135</td>
<td>59,903</td>
<td>712,038</td>
<td>-333,915</td>
<td>-31.92%</td>
</tr>
</tbody>
</table>

### Attendance

The attendance rate at Mason County High School dropped less than a tenth of a percentage point from the 2011-2012 to 2012-2013 school year. There was also a significant increase in student tardies up 63 from the previous school year from 218 to 281.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ATTENDANCE RATE</th>
<th>END OF YEAR ENROLLMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-2011</td>
<td>91.9</td>
<td>821</td>
</tr>
<tr>
<td>2011-2012</td>
<td>91.86</td>
<td>834</td>
</tr>
</tbody>
</table>
Behavior

Based on the comparison of Mason County High School discipline data there were 35 less infractions after implementing the iPad 1:1. The data collected from the 2011-2012 and 2012-2013 school year was broken down into the number of occurrences of specific events. The high school’s enrollment was exactly the same between the two school years. Cell phone violations decreased probably because the students have access to iPads. There was a decrease in defiance of authority but disorderly conduct increased. School bus disturbances decreased significantly possibly because students are engaged with the iPad on the drive home. Take a look at the behavior report chart for the overall summary and breakdown of specific events. See Figure 9 for the MCHS behavior report comparison.

<table>
<thead>
<tr>
<th>Event Type</th>
<th>2011-2012</th>
<th>2012-2013</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment</td>
<td>834</td>
<td>834</td>
<td>0</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>2</td>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>Assault</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cell Phone Violation</td>
<td>53</td>
<td>38</td>
<td>-15</td>
</tr>
<tr>
<td>Cheating</td>
<td>1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Defiance of Authority</td>
<td>194</td>
<td>175</td>
<td>-19</td>
</tr>
<tr>
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Kentucky P-20 Data Collaborative (2012)


U.S. Census Bureau (2012)


Reference List


Kentucky P-20 Data Collaborative (2012)

Retrieved from [http://kentuckyp20.ky.gov/CountyProfileReports.aspx](http://kentuckyp20.ky.gov/CountyProfileReports.aspx)


U.S. Census Bureau (2012)

VITA

KERMIT E. BELCHER

Place of Birth: Pikeville, Kentucky

EDUCATION

December, 2004 Bachelor of Science
Morehead State University
Morehead, Kentucky

July, 1997 Master of Science
Morehead State University
Morehead, Kentucky

Pending Doctor of Education
Morehead State University
Morehead, Kentucky

PROFESSIONAL EXPERIENCES

July, 1996 - Technology Education Teacher
June, 2000 Marion County High School
Lebanon, Kentucky

July, 2000 - Assistant Principal
June, 2001 Marion County High School
Lebanon, Kentucky

July, 2001 - Chief Information Officer / Facilities Director
September, 2012 Mason County Board of Education
Maysville, Kentucky

September, 2012 - Assistant Superintendent
Present Mason County Board of Education
Maysville, Kentucky
HONORS

2004-2007
Apply annually for technology funds from Universal Schools and Libraries.
- Received $800,000 in E-rate federal funds in 2004
- Obtained $1.2 million in E-rate funds in 2007
These funds enabled Mason County Schools to upgrade network infrastructure including wireless access capable of 1-1 student instructional device ratio.

Instituted 21st Century Classroom Initiative
- Smart Boards, sound system, document cameras, Apple TVs and projectors

Purchased teacher notebook computers for all teachers in the district since 2004
- Teachers have the choice between a Mac and PC

 Constructed a 15.2 million dollar new elementary school while serving as Facilities Director.
- Mason County Intermediate School
- Featured in Kentucky Teacher Spring 2007

Mason County Board of Education
Maysville, Kentucky

2010
Received $67,500 Title II D competitive grant funds to enhance technology. The grant focused on integration of iPad mobile devices to enhance classroom instruction. Implemented iPads for students, teachers and administrators.

Taught post secondary principal certification technology courses for Midway College and Morehead State University

Obtained $200,000 in E-rate funds for Internal Connections
Mason County Board of Education
Maysville, Kentucky

2012
Implemented 1:1 iPads for students and teachers grades 9-12. According to Forbes list, the deployment was the 82nd largest iPad deployment in 2012.
Mason County Board of Education
Maysville, Kentucky
2013
Aquired a $200,000 donation from Carmeuse North America Lime and Limestone for a regulation track and soccer field.

Administered a $3 million dollar renovation; including school safety, energy efficiency, paving, and ADA accessibility.
Mason County Board of Education
Maysville, Kentucky

2014
Provided WiFi on select school buses for student organizations and athletes. Students are able to work on blended learning opportunities during bus rides to and from extracurricular activities.

Developed a $4.5 million dollar STEAM Academy for Mason County High School Students. The academy will offer Science, Technology, Engineering, Agriculture and Medical (STEAM) in pursuit of College and Career Readiness.
Mason County Board of Education
Maysville, Kentucky