ABSTRACT OF CAPSTONE

Lisa Cluxton Jones

The Graduate School
Morehead State University
July 29, 2013
TRANSFORMATIONAL CHANGE VIA DISRUPTIVE TECHNOLOGY: REMOVING EDUCATIONAL BARRIERS IN K-12 THROUGH DISTANCE AND BLENDED LEARNING

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

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Berea, Kentucky

Committee Chair: Dr. Christopher Miller, Professor

Morehead, Kentucky

July 29, 2013

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TRANSFORMATIONAL CHANGE VIA DISRUPTIVE TECHNOLOGY: REMOVING EDUCATIONAL BARRIERS IN K-12 THROUGH DISTANCE AND BLENDED LEARNING

This project addressed the use of technology for distance and blended learning education in the Kentucky K-12 classroom. The benefits to using distance and blended learning education include: addressing calamity day cancellations, reducing the weighty carbon footprint in K-12, preparing K-12 students with post-secondary technology skills and providing alternative classes to rural schools for better learning experiences and options for at-risk students. A written and digital framework for implementation of a model learning management system was provided.

KEYWORDS: distance learning, blended learning, learning management system, K-12, seat-time.
TRANSFORMATIONAL CHANGE VIA DISRUPTIVE TECHNOLOGY: REMOVING EDUCATIONAL BARRIERS IN K-12 THROUGH DISTANCE AND BLENDED LEARNING

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Lisa Cluxton Jones

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Capstone

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Lisa Cluxton Jones
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Morehead, Kentucky

July 29, 2013

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DEDICATION
This capstone document is dedicated in loving memory to my dad, Don Cluxton, who did not get to see me finish this race. You taught me that anything worth doing is worth doing right. I hope I have honored that principle from you here. This dedication was without a doubt, the hardest part of this paper to write. Until we meet again, I love you Dad.
ACKNOWLEDGEMENTS

I want to acknowledge my patient husband, Leslie Jones, for putting up with the glowing light of a computer screen for the last 3 years and for always supporting me in my education. To my uncle Paul White who has supported me financially as well as encouraged me in the tough times to persevere and who taught me that education, reading, critical thinking and chess are important and worthy endeavors.

I could not have made it here without you.

To my wonderful professors, beginning at Shawnee State and Professor Emeritus Dr James Flavin. You were the first person that saw a writing spark in me and lit it into a raging fire while modeling to me the highest example of what a teacher and citizen of the world should be. I hope I am half the example to others that you have been to me.

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I am privileged to have you all as teachers, mentors and examples and I hope I am but a small reflection of your teaching excellence to others.
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**Executive Summary**

*What is the core of the capstone?*

The purpose of this capstone is to provide a written framework and a digital model for Kentucky K-12 teachers and administrators to use to create and implement mirrored classroom/s using online technology. The original problem statement evolved from conversations on the issue of cancelled school due to snow-days that cause missed seat-time for Kentucky students. Missed seat time and interrupted instructional time should be unnecessary in the 21st century digital age. Through the creation of mirrored classrooms, Kentucky schools can avoid missed instructional time for snow cancellations, for illness and for students who have excessive unavoidable absences.

A mirrored classroom is defined here as an online digital repository using a Learning Management System (LMS), such as Blackboard, to store classroom curriculum documents, assignments, announcements and learning resources that mirror the face-to-face traditional classroom. Teachers could use the mirrored site to store weekly assignment postings and handouts, even when school is in session. This can be easily accomplished by the use of digital documents stored on the LMS site.

In the event of school cancellations, students can continue uninterrupted classroom work on assignments during the loss of seat-time activities. Ideally, the LMS mirrored site will also be a repository of resources for students to use even when no cancellations and lost seat time are expected. Further, the Kentucky Department of Education could consider accepting work completed online during
snow day cancellations as equal to face-to-face classroom work when computing required attendance days for the academic year. Much research has been and is currently being studied that implies online work is equivalent or superior to the face-to-face classroom. Research on the “flipped classroom,” where teachers post their lectures or models for instruction in video format and then use the classroom seat time for active learning is changing the face of education as we have known it for decades in our educational system (Arora, 2009; Carmody, 2009; Project RED, 2010; Innes, 2011).

The biggest obstacle to this paradigm shift for Kentucky education is access. As many as 79% of Kentucky students have at least some access to the Internet when away from school grounds (Couch, 2012). Utilizing online technology to save paper consumption and the costs associated with make-up days may save enough school funds to help offset technology costs for students in low income situations. Providing an alternative to the industrial age model of learning may alleviate problems with school cancellations, raise test scores based on mastery, address high-dropout rates and ultimately propel Kentucky students towards a 21st century learning model that is the basis of the new global economy.

As a futuring exercise, the idea of a mirrored classroom can be expanded outward to include the possibility of sustainability issues through the use of e-texts, bartered classroom teaching to address teacher shortages, online dual credits and mentoring/advising for students in jeopardy of dropping out of school altogether. Another benefit is that the mirrored or digital classroom could ultimately bring a
higher quality education to students in rural areas of Kentucky who might not otherwise have such an expanded learning opportunity. A mirrored classroom can alleviate the immediate problem of solving the snow days’ question in Kentucky schools, but it may also address many other pressing issues in Kentucky K-12 schools with benefits that have a far reaching influence in our post-secondary institutions and our community in a global and digital economy. Moving Kentucky K-12 to a 21st century model is not an option. It is an imperative that our students must have to be successful in the new global workforce. Creating mirrored classrooms for K-12 schools is a first step towards creating an equitable education for Kentucky students and our own economic future.
Impact and Imperative for Kentucky Schools

Distance learning and blended learning are inadequately used in Kentucky K-12 schools due in part to lack of access to technology as well as the perception that classes driven by technology are inferior to the traditional face-to-face classroom (Parry, 2009; "Sloan-C Findings," 2012). These perceptions may be tied to outdated industrial age models of learning and the prevalent ideas about education that accompany these models. A paradigm shift in thinking must occur to allow educational technology to play an integral part in 21st century educational reform. Digital reform will provide the skills needed in a 21st century global economy. Kentucky K-12 should utilize distance learning and/or blended learning through better technology use in all classrooms and through providing mirrored classrooms online (digital replications of classroom work), through Learning Management Systems such as Blackboard or Moodle. Mirrored classrooms can be defined as a teacher-created digital space using an application such as Blackboard, where students and teachers can interact through discussion and assignments in a virtual setting. Distance learning is defined as a teacher’s ability to transmit curriculum content via an Internet based Learning Management System to the student in a 24/7 learning
Blended Learning is defined as a teacher's ability to integrate technology tools in the face-to-face classroom that enhance a student's ability towards ubiquitous learning.

Presently, the Kentucky Department of Education (KDE) has a technology policy that does not include information on the implementation of hybrid/blended learning or distance/online classrooms for Kentucky K-12. The 2007-2012 Technology Master plan for Kentucky states that its Master Plan objectives are:

- Anytime, anywhere, always-on, differentiated teaching and learning
- Capacity building and enhancement of staff and resources
- Data-driven decision-making for teachers and administrators
- Efficiency and governance


Since the 2007-2012 KDE Technology Master Plan states, “anytime, anywhere, always-on learning,” this language infers the need for virtual learning spaces in K-12. This concept is revolutionary, fundamentally changing the way students, teachers, parents and administrators interact with the state’s educational program” (KETS, 2006, “Master Plan,” p. 19).

One of the goals stated in the 2007-2012 Master plan is for, “Schools and students [to] have access to online courses that can be taken outside the classroom” (KETS, p. 28). However, the former Kentucky Virtual High School/Kentucky Virtual Schools is listed as “closed” on the Kentucky Department of Education website (“KDE Technology,” 2012). Resources are listed in the technology section of the
KDE website that direct teachers and administrators to third party resources for digital lessons, communities of practice and professional development. The exception is the Barren Academy of Virtual and Expanded Learning in the Kentucky Barren County School district, which uses the Florida Virtual High School online curriculum as well as resources from KET and other post-secondary digital sources.

The released KETS Master Plan for 2013-2018 expands on the previous plan. Main objectives for the Master Plan are:

- a more informative and engaging experience for students
- addressing the different learning and teaching styles of all students and teachers
- deepening the understanding of academic content
- data-driven decision-making
- ease of access
- creation and production of products and content
- gathering, analyzing and synthesizing information
- communication and collaboration with others (KETS, "Master Plan," 2012).

The 2012 KETS *From the Beginning* report, also mentions the paradigm shift education must make in a 21st century environment. This plan mentions online and blended learning, suggesting that Kentucky needs to grow in this area:
Online learning encompasses not only coursework that could be applied toward a grade, but also Web 2.0 collaborative and assessment tools so that both students and teachers can reap the rewards of anytime, anywhere learning environments. The social learning experience within the K-12 environment has evolved from study hall and library meetings to tweeting and micro blogging. According to the Speak Up 2010 National Findings, 46% of students regularly utilize their social networking site to collaborate with classmates on school projects. (p. 18)

This report goes on to suggest that "there is still progress to be made" in the use of digital and blended learning in Kentucky K-12 schools (p. 18). Lack of training and access are still concerns in many districts as well as support for teachers who wish to utilize Web 2.0 tools and LMS systems for a blended learning environment in their classes.

According to the Kentucky Department of Education (2011) document, Transformations: Kentucky’s Curriculum Framework, Volume II:

The heart of transformation is accepting that all students can learn at high levels—higher than has ever been expected of most students. This vision represents a radical departure from the way we have normally thought about students. We cannot transform schools if we continue with a view of high achievement for select group of students, moderate achievement for the majority, and low achievement as an acceptable alternative for others. The statewide commitment to the belief that all students can learn at high levels and the commitment to a standards-based approach to education set the stage
for the implementation of the tools necessary for attainment of this belief. These tools include alternative ways of enabling learning, curriculum/assessment connections, and making learning connections. (KDE, 2011)

The model proposed here seeks to build on the statements in the Kentucky Department of Education's Transformation framework so that the commitment to all students learning at high levels through alternative means can be achieved. This proposed framework will seek to achieve these goals through the implementation statewide, of a framework for building online mirrored classrooms for every K-12 class in Kentucky public schools. This framework will outline and propose ways for administrators and teachers to develop and create active learning classrooms, both face-to-face and online, using distance learning technology as well as provide a means to address problems such as missed days due to weather or illness related closings, cost-saving measures due to paper waste reduction and the paperless classroom and to model highly effective critical thinking and technologically advanced learning experiences through constructivist and student-centered activities.

Utilization of distance learning and blended learning in K-12 will specifically address the growing problem of missed instructional time due to weather related cancellations. Subsequent beneficial consequences such as improvement of 21st century technology skills, ease of transfer to post-secondary institutions that utilize similar technology, increased critical thinking skills and other secondary benefits are expected to be positive. Research suggests that distance learning combined with
scaffolding pedagogies based on a Vygotskian model will enhance student performance in many areas and this proposal may prove that better use of technology in rural Kentucky areas will lessen the impact of poverty on education and concurrent high drop-out rates (Koohang, et al., 2009; Innes, 2011; Project Red, 2010; Shaw, 2012). It may also prove to be economically advantageous to school districts struggling for funding in a traditional classroom.

Even though many studies suggest that moving to a blended learning environment in K-12 will have positive benefits, negative consequences are expected to be tied to technology and online access (Watts, 2010; Couch, 2012). Professional development will be expected for teachers in advance of the introduction of online learning in individual classrooms. Teachers will be expected to translate basic skills to students and parents who will use the mirrored class. Florida Virtual High School, a decade-long leader in K-12 online education, provides 800 hours of professional development training to certified teachers in their virtual high school (Mackey & Horn, 2009). These are the initial areas where grant funding or alternative funding may be needed. The federally funded Promise Neighborhood Grant presently awarded to Berea College in Kentucky has funded some initial pilot programs that focus on technology integration in the specific school districts of Clay, Jackson and Owsley counties in the Commonwealth of Kentucky. Grants such as these will help alleviate the initial costs of implementing broad technology integration as is discussed in this proposal and framework. The final products in this capstone will address these beginning training needs.
Buckner (2011) describes this initiative as imperative "to address significant challenges faced by students and families living in high-poverty communities by providing resources to plan and implement a continuum of services from early learning to college and career. Plans include a range of services from improving a neighborhood's health, safety, and stability to expanding access to learning technology and Internet connectivity, and boosting family engagement in student learning" ("Berea College," 2011). A study by the International Association for K-12 Online Learning describes access as remaining a challenge to many school districts, in poor rural areas (Wicks, 2010).

Wicks (2010) describes this challenge stating:

Online courses require, at a minimum, that the student have access to a computer, basic software, and the Internet. For students in affluent areas such access is assumed, but for students in poor inner-city and rural areas the hardware and Internet access are not a given. Educators must work to ensure that the opportunities of online education are available to students across all income levels, geographic regions, and ethnic groups. In addition, online courses can pose challenges for students with learning or physical disabilities. Most schools have been quite good about ensuring that online programs are available to students with disabilities. As online programs become increasingly mainstream, they must continue this commitment. (p.19)
While David Couch (2012), Associate Commissioner for the Office of Educational Technology, describes Kentucky students as more than 50% connected to the Internet via home computers or through mobile devices such as iPhones, some Kentucky students still reside in rural and high poverty areas where access to DSL internet connections is sporadic and financially unobtainable. Learning Management Systems such as Blackboard are very expensive. However, many school districts already have access to Blackboard that is underutilized by classroom teachers. Free alternative LMS applications do exist for teachers to use without the support of their school's IT department, such as Blackboard's free access to Coursesites, Edmodo, Wikispaces and other free Web 2.0 tools.

Within this project, written guidelines on how to begin using a free LMS site through Blackboard Coursesites will be available. A digital model through Blackboard Coursites will be available online and with password access, the course template can be copied to a new course shell.

Kentucky's Growing Problem

*Why was this capstone strategy selected?*

According to the United States Census bureau, Kentucky has an 81% high school graduation rate, 4% lower than the national average ("State and County Quickfacts," 2012). The poverty rate in Kentucky is 17.7%, nearly four percent higher than the national average, putting Kentucky in the top ten list of high poverty states ("State and County Quickfacts," 2012). Kentucky's drop-out rate rose from
2.89% to 3.19% in the single year of 2010 (Winn, 2011, par. 1-3). Poverty and educational attainment are closely related. Introducing technology driven options into the classroom for the initial purpose of addressing missed seat-time due to calamity days may alleviate some of the obstacles Kentucky faces in delivering high impact and quality educational experiences in poor areas as well as address growing concerns of high drop-out rates. Technology solutions as proposed here have not been adequately implemented and supported in Kentucky schools.

Berea College in Berea, Kentucky has been awarded a grant for the federally funded Promise Neighborhood initiative. Because of Berea’s historical roots in providing education to students from high poverty areas as well as minorities, Berea is positioned to make an impact on student’s lives and education through the work that is being done in this grant area. Former President Larry Shinn states, “The Promise Neighborhoods program aims to address significant challenges faced by students and families living in high-poverty communities by providing resources to plan and implement a continuum of services from early learning to college and career. Plans include a range of services from improving a neighborhood’s health, safety, and stability to expanding access to learning technology and Internet connectivity, and boosting family engagement in student learning (Buckner, 2011, par. 6).

Data extracted from the Berea College Promise Neighborhood Grant states that, Kentucky per capita income is $20,482, nearly $6000.00 less than the U.S. national average. The child poverty rate in Kentucky is 20.4% compared to the national average of 16.1% (“Berea College Promise,” p. 3). In the mountainous
areas of Eastern Kentucky, schools often miss more than 25 days of school due to winter weather, ("Berea Promise," 2010, p. 3). This disruption has a negative impact on student learning experiences and their ability to do well when standardized testing occurs in the spring. As seen in Promise Neighborhood data, four Eastern Kentucky counties included in the study experience disruptions due to school cancellations and have low grade level scores. For high school students in the Promise Neighborhood counties, only 50% of high school male students are at their grade level for reading and 40% are at grade level for mathematics ("Berea Promise," 2010, p. 6). For high school females in the Eastern Kentucky Promise Neighborhood, the numbers are dismal with 64% at grade level in Reading and only 30% at grade level in Mathematics ("Berea Promise," 2010, p. 6).

Further, according to data from 2010, only 49% of Kentucky 11th grade students are college ready in English and only 22% are college ready in Mathematics ("Berea Promise," 2010, p. 8). These data suggest alarming trends for Kentucky schools and fall well below the national averages of 66% and 43%, respectively. Such data signal a serious problem that may not be addressed using traditional methods in education. Innes (2001) cites the following information on Kentucky Recent Graduates (See Figure 1):
As students in Kentucky progress to high school, attendance rates decline, especially in the mountainous and poorer areas of the Eastern Kentucky counties listed in the Promise Neighborhood. According to the Promise Neighborhood study, students from the grant counties have an attendance rate of 90.96% upon entering the 9th grade compared to Kentucky's statewide attendance rate for the same grade level at 92.98% ("Berea Promise," 2010, p. 6). As Kentucky students' progress towards a high school diploma, studies demonstrate that many are failing to attend face-to-face classes and thereby achieving worse scores on standardized testing for their grade levels and that situation may eventually lead to many of them dropping out of school. Wynn (2011) reports that a ten percent increase in Kentucky drop-out rates is noted
for 2010 and “the number of students who quit school between the ninth and 12th grade rose from 5,673 to 6,225, an increase of nearly 10 percent” (Winn, 2011, par. 1).

The studies resulting from the Berea Promise Neighborhood project and other resources suggest that Kentucky schools are moving in the wrong direction when it comes to student achievement, dropout rates, and proficient use of technology in the classroom. Moving to a blended learning classroom model for missed instructional time may prove beneficial to Kentucky students struggling with obstacles such as high poverty and drop-out rates.

**Research Question**

How might Kentucky schools address the issue of lost seat time due to school cancellations and simultaneously provide 21st century technology skills to students, and establish a model of environmentally sensitive behavior? Technology and distance learning in Kentucky K-12 are underused and could be integrated more efficiently to address several pressing issues that may also raise the educational performance of Kentucky students. Research suggests that online learning and the use of Web 2.0 tools increase critical thinking skills while also providing 21st century technology skills to students (Klopfer, Osterweil, Groff & Haas, 2009). All of these benefits are directly tied to ongoing initiatives in Kentucky SB1 and the Kentucky standards initiative.

This project sought to develop a framework for Kentucky school districts that modeled new methods of curriculum delivery based upon evidence from educational
The delivery methods involved distance learning and various technology driven tools that can be used in the traditional classroom as well as the online classroom. A written guide created for ease of use by teachers and administrators was part of this capstone project, along with an interactive Blackboard online model that contained various tutorials and examples of how to mirror a face-to-face classroom and how to implement its use during snow day cancellations.

Addressing missed instructional time can also create a paperless classroom when learning management systems such as Blackboard or Moodle are used. Potential savings for Kentucky could be multiplied by several hundred thousand dollars per school per year, creating a cost savings that can fund technology enhancements such as wireless connections in the classroom, iPads for students to rent and models a sustainability plan that addresses Kentucky’s E2 initiative simultaneously.

This framework is one approach that addressed the ongoing problem in Kentucky of lost instructional time due to snow day cancellations. Collaboration consisted of approaching the problem from individual doctoral research that culminated in a model template that can be utilized in any classroom across the state. This project resulted in an original framework and model for mirrored classrooms in K-12 with examples that can be distributed to and replicated by Kentucky teachers and administrators. The desire to create a collaborative Teaching and Learning Commons in an online format such as a free Blackboard course is imperative to the
success of the project. Feedback circles for teachers, administrators and parents was modeled and an initial site created for that purpose.

Step-by-step instructions were provided via a digital model classroom where videos on how to create an LMS through the use of a free Blackboard site were modeled. Implementation will occur when teachers access and use the site as a resource for their classroom needs. The CD provided in this capstone provides access to the digital template, along with the written guide. All components of this capstone will be made available through the Graduate School of Morehead State University as part of the requirements of this project.

The digital and written framework was designed to allow administrators and teachers to easily replicate a distance learning, mirrored site for any K-12 classroom. This framework provided easily understood resources and examples so that school systems in Kentucky can address the following through online technology:

- Addressing missed instructional time during snow days or other calamity absences.
- Simultaneously integrating 21st century technology skills through the use of distance learning and thereby addressing specific technology requirements in Kentucky SB 1.
- Providing a seamless transition from high school to post-secondary through the better use of technology integration
• Addressing vital secondary issues such as high drop-out rates, post-secondary success rates, testing scores, quality of curriculum and better environmental practices such as reduction of paper waste.

There is no doubt that Kentucky schools will benefit when implementing this framework and the ideas on how to use mirrored classrooms online to address missed days and seat time due to unexpected closings. Kentucky can be on the forefront of a transformational change in education if this small step blossoms into a larger, more inclusive picture that will address not only how we navigate weather-related absences, but how well we prepare our students for a vastly different future than what we can presently offer.
Chapter 2

Review of Literature

Literature on blended learning and the K-12 classroom is accelerating in the United States. Other countries such as Australia have embraced 21st century learning in K-12 at a much faster rate than districts in this country. 21st century learning is defined in this project as providing students with ubiquitous learning opportunities through the use of blended and distance learning technology in the classroom. Many of the studies described in this literature review are recently conducted and have no prior studies to compare. More studies on the need for blended learning environments in K-12 are needed to assess the greater need and the possible benefits of moving to a more blended learning model for K-12 classrooms.

The 24-hour K-12 virtual classroom is an idea whose time has come. Reid, Aqui & Putney (2009) describe this new learning space as “virtual high schools [that] offer alternative solutions to educating K-12 students who may not be well served otherwise” (p. 282). Students may miss days due to weather cancellations, disability or illness. If a complementary online classroom exists for students to access, these barriers to education seem to vanish. Not only will students be better served through completing assignments during school cancellations, but they will engage in ubiquitous learning. They will utilize technology for the 21st century workforce and will become accustomed to a higher standard of education that can replicate curriculum not available to most rural and poorly funded areas.
Picciano and Seaman (2009) note that "more than a million K–12 students took online courses in school year 2007–08" (as quoted in Means, et.al, 2009). A meta-analysis by the U.S. Department of Education titled, "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies," gives an exhaustive overview of the implications of emerging trends in distance education in K-12 classrooms. For this study, Means et.al, (2009) summarized the meta analysis as providing evidence that, "the meta-analysis found [on] average, students in online learning conditions performed better than those receiving face-to-face instruction (ix) According to the same study, blended learning classroom, defined as classrooms that deliver content in both face-to-face and online settings, have even better outcomes than a traditional face-to-face classroom (Means, 2009, p. xi-xii).

Researchers for this study asked four central research questions:

- How does the effectiveness of online learning compare with that of face-to-face instruction?
- Does supplementing face-to-face instruction with online instruction enhance learning?
- What practices are associated with more effective online learning?
- What conditions influence the effectiveness of online learning? (Means, et.al, 2009)
Generally, the idea of using distance learning in K-12 can be described more accurately as blended learning because it emphasizes the idea that students will still attend a face-to-face class and will complete some classes or assignments online. According to Horn (2011) writing for Forbes magazine, K-12 administrators and educators are taking notice of the rapid expansion of technology tools in the classroom. Horn (2011) also describes blended learning as, “Blended learning is any time a student learns at least in part at a supervised brick-and-mortar location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace” (“Rise of K-12,” 2011, para. 3).

A complementary online classroom should mesh with the existing face-to-face classroom. It can provide the necessary curriculum online that corresponds to content the teacher delivers in the traditional classroom. Posting homework or other classroom materials online could remove the necessity of cancelling school and then making up instructional days missed. Having students participate in online education during inclement weather also reduces the negative financial impact of holding classes on days when dangerous road conditions cause low attendance with resulting state funding penalties. The financial benefits that might be achieved through the use of online mirrored classrooms, the replication of classroom activities online, are many. One such possibility is that of changing to a four-day week, and could prove advantageous to rural school districts with low tax rate funding or other funding concerns. Online delivery of K-12 content can be seen as a compliment to the traditional classroom and one that can supplement the face-to-face classroom
instruction and provide alternatives to the instructional days requirement.

Additionally, technology skills used for make-up days in an online learning environment will provide students with a seamless transition to the technology skills needed in community colleges and universities.

According to a study by Bernard et. al (2009), online education is rapidly expanding in all levels of education from K-12 through community college and four year universities. Bernard (2009) states, "In the 1990s, the Internet and high-speed access began to affect DE courses, bringing them closer to the mainstream of educational practice (Peters, 2003), so that today, applications of online and Web-based DE abound. Evidence of the widespread application of DE includes the rise in dedicated virtual high schools and level of choice between DE and classroom instruction (CI) that many universities now offer their students (p.1244). As Bernard et. al (2009) points out, much of the reluctance to using distance learning in K-12 or post-secondary classrooms is due to the perception that face-to face instruction is of higher educational value than distance learning instruction. Several studies seemingly disprove this perception such as Bernard, et.al (2009) and Mayer (2001). Mayer (2001) states:

A range of knowledge tools may also be used to promote better quality DE interactivity. For example, Mayer (2001) and others have shown that interactive multimedia can lead to improved learner performance compared to text-only conditions. Multimodal representations and dynamic representations, especially in Mathematics and sciences, may help make complex concepts
more understandable; more efficiently learned; better retained; and more readily recalled, applied, and transferred. It is arguable that the range of established tools currently available to educators, such as learning management systems technologies, has yet to be developed sufficiently or examined systematically by the community of DE developers and researchers for their capacity to activate interactive behavior. We encourage more and better quality research along these lines, as well as increased research activity in elementary and secondary school applications of DE (p.1267).

Cavanaugh (2001) describes distance learning studies as having more in-depth research in adult online experience as opposed to K-12 studies (p. 76). In 2001, Cavanaugh (2001) notes that the emphasis on installing hardware and computers in K-12 was a primary focus of integrating technology and the idea of “Distance acquisition of knowledge is often an expensive and time-consuming process to institute and maintain” (p. 75). Cavanaugh (2001) further notes that, “distance education research has not been subjected to repeated review and synthesis, especially in regards to K-12 education” (p. 75).

Eight years later, Means et.al, (2009) performed a comprehensive study for the U.S. Department of Education distance learning in K-12. Means (2009) describes the goal of this comprehensive study as, “to provide policy-makers, administrators and educators with research-based guidance about how to implement online learning for K-12 education and teacher preparation” (p. xi). Means (2009) further noted that more than one million K-12 students took an online course in 2007-2008 (p. xi). This
change to integrating technology used in distance learning is growing in K-12 exponentially. However, Kentucky is lagging behind in its K-12 implementation.

The most important findings from the Means (2009) "meta-analysis of 51 study effects" are summarized here and directly inform this project:

- Students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction.

- Instruction combining online and face-to-face elements had a larger advantage relative to purely face-to-face instruction than did purely online instruction.

- Studies in which learners in the online condition spent more time on task than students in the face-to-face condition found a greater benefit for online learning.

- Most of the variations in the way in which different studies implemented online learning did not affect student learning outcomes significantly.

- The effectiveness of online learning approaches appears quite broad across different content and learner types." (Means, 2009).

Online learning can be enhanced by giving learners control of their interactions with media and prompting learner reflection. A student centered classroom that is enhanced with technology can cultivate an atmosphere of critical inquiry and ubiquitous learning not always found in a traditional classroom that does not utilize 21st century digital skills.
The study conceded that much of the literature review and studies were based on information from adult learners but postulates that the results can be generalized to K-12 students. Means (2009) concluded that online learning, especially blended learning where distance technology is used to "expand" the learning experience is probably the best model for K-12 classrooms to follow. Means, et.al, (2009) suggest that since there are not many studies presently undertaken to track and gather data on K-12 blended learning initiatives, research may prove that blended learning in K-12 exceeds face-to-face instruction methods. This project assumed that providing a blended learning environment based on constructivist design will significantly improve Kentucky student achievement scores especially as these relate to missed seat time due to snow days or other calamity days.

O'Dwyer, Carey and Kleimen (2007) studied a Louisiana initiative to deliver Algebra I online to high school students. The study suggested that students from high poverty areas who are struggling with math can perform better through the use of highly interactive blended learning classes (p. 303). In the Louisiana experimental online Algebra class, "[t]he innovation of the Louisiana model is that it enables a school to have a certified teacher available when one is not locally present, while still providing students with the structure and opportunities afforded by regular class meetings (p. 291). The Louisina Online Algebra study concluded that replacing a traditional face-to-face algebra class with the online or digital version is a "viable" option with many benefits (p. 304). This model could be interpreted in Kentucky
schools as a way to provide specialized classes, especially in science and math, by teachers that might not be available to students otherwise.

Zanderberg and Lewis (2008) stated, "that 37 percent of public school districts had students enrolled" in a distance learning or blended learning class in the 2004-2005 school year (p. iv). Zanderberg and Lewis (2008) note that most K-12 schools use distance learning classes as an alternative to students who have failed or are failing face-to-face courses and as a way to supplement high school curriculum with courses that could not otherwise be offered at the high school. This potential opportunity becomes a significant reason for Kentucky to implement more distance learning classes as many rural schools in Kentucky do not or cannot offer specialized courses in Math or Science due to a lack of available teachers in a specialized field. Offering such classes online to high school students could propel these students on to post-secondary in greater numbers with more success.

Zanderberg and Lewis (2009) refer to Sloan-C study and Project Red as finding that, "perceived importance by districts of online learning mostly relates to (in the order of importance) 1) offering courses not otherwise available at the school, 2) meeting the needs of specific groups of students, 3) offering AP or college-level courses, 4) reducing scheduling conflicts for students, and 5) permitting students to retake courses they failed (as cited in Picciano and Seaman 2007). All of these important issues could be addressed simultaneously when Kentucky K-12 classrooms implement a mirrored classroom design.
The Carnegie Unit vs Mastery Learning

According to a definition on the SUNY educational website, the Carnegie Unit is defined in this way:

The unit was developed in 1906 as a measure of the amount of time a student has studied a subject. For example, a total of 120 hours in one subject — meeting 4 or 5 times a week for 40 to 60 minutes, for 36 to 40 weeks each year — earns the student one "unit" of high school credit. Fourteen units were deemed to constitute the minimum amount of preparation that may be interpreted as "four years of academic or high school preparation." (SUNY, Faculty Senate FAQ's, 2012).

Required seat-time in Kentucky schools is becoming a major issue in graduation rates and no formal alternative to seat time presently exists in a standardized fashion to address this ongoing and rapidly progressing need. Students from poor Kentucky areas face an educational dilemma where many decide to drop out after many years of falling behind. As an adult, many students seek to return to school, only to find they must enter GED programs or take several remedial courses in college before they are ready for standard college courses ("Berea Promise," 2010, pp. 1-10). For Kentucky students in high poverty areas, distance learning technology can be utilized to help them stay current on work in spite of school cancellations, provide high quality learning experiences and possibly keep many from dropping out altogether, breaking the detrimental cycle of poverty in our poorest neighborhoods (Wicks, 2010; , 2012; Pascopella, 2003).
Cavanaugh (2012) describes a loosening of the “seat time” requirement across the country with an emphasis on using distance learning technology to compliment and even replace the physical requirements of seat time. Cavanaugh (2012) notes, “States have established an array of policies in recent years to free schools from having to award academic credits based on “seat time” (S12). Cavanaugh (2012) states that the main objective in changing the seat time requirement is to switch from a physical presence calculation based on attending a brick-and-mortar space, to awarding credit based on proficiency and mastery in the required subjects (S12). Understandably, this approach seems to be the impetus for the rising student scores seen in preliminary data coming out of these virtual classes. Logically, students who are awarded credit based on mastery of a subject, even if that subject is mastered virtually, is a much better scenario than credit awarded for physical presence and a passing grade. As Jason Glass, Director of Iowa Department of Education states, “having a seat in class, doesn’t guarantee you anything” (Cavanagh, 2012, S12). It may guarantee that school districts will continue to have high dropout rates and increasingly lower and lower test scores. Conversely, students attending virtual classes at institutions such as the Florida Virtual High School are showing the opposite trend.

In 2005, New Hampshire became the first state to remove the Carnegie Unit from the state criteria for awarding credit (Cavanagh, 2012, S12). Currently in Kentucky’s Division of Innovation and Partner Engagement, David Couch, director, oversees pilot programs in several Kentucky districts attempting to change the way
seat time is calculated as well as implement a broader use of distance learning technology (Cavanagh, 2012). If Kentucky schools can effectively use mirrored classrooms to address snow-day cancellations, other relevant uses for the digital delivery of content may become more apparent and easily implemented. Efforts to remove the Carnegie Unit as it relates to physical seat time in order to begin using a standardized system of measuring academic achievement through mastery and proficiency may pave the way for better use of distance learning technology in Kentucky K-12.

Effects of Poverty on Education

Ruby Payne describes poverty as “relative” and “exist[ing]” in relationship to known quantities or expectations” (1996, p. 2). Research suggests that poverty has a detrimental effect on learning and education. Similarly, learning and education are defined in their relationship to known quantities and/or expectations. Most of the expectations revolve around the industrial age model of learning that expects students to perform rote memorization skills that lack critical thinking skills; a skill that students growing up in poverty must be taught in public education if we expect them to succeed in a 21st century global economy.

Students from poor schools often lack more than just funding due to geography; they also lack teachers who stay due to low salaries and less than optimal living arrangements (Pressley, Bradford, White & Gong, 2005). Further, students from rural schools in high poverty areas may never have the quality of learning experiences that benefit students from more affluent school districts. Experiences
such as visiting museums, listening to poets, visiting a NASA flight school are out of the question for most of these students. Through technology, teachers can bridge this gap virtually, providing students with virtual experiences online that can optimally broaden the student’s educational experiences, even if from a distance. The majority of this kind of virtual gap can be accomplished using free online resources and free Web 2.0 tools readily available to the teacher and the student.

Payne (2005) describes teaching and learning in this way: "teaching is what occurs outside the head, learning is what occurs inside the head" (pg. 88). In this simplistic definition lies the heart of the reluctance to move education in K-12 to a blended or online environment. That reluctance assumes that even though it is generally agreed that learning takes place “inside the head” it also must take place inside a physical building in the presence of a teacher. This assumption keeps administrators and teachers from effectively using technology to deliver high quality educational experiences to students that desperately need an alternative to the outdated industrial model. This kind of linear education does not reinforce much needed critical thinking skills. Instead, it stifles student ability to learn and their creativity in learning is greatly diminished. Sir Ken Robinson (2009) explains this process as a flawed system where, “[e]ducation is the system that's supposed to develop our natural abilities and enable us to make our way in the world. Instead, it is stifling the individual talents and abilities of too many students and killing their motivation to learn" (par.4). Implementing technology effectively into the K-12 classroom can not only address immediate issues such as missed days, but can
literally open the world to our students. It can spur a creative learning that creates an atmosphere of pursuing education, critical thinking and 21st century skills, rather than pursuing standardized testing scores.

Payne (2005) states that “two things that help one move out of poverty are education and relationships” (pg. 3). Education in rural schools is bound by geography and many other obstacles, including access to technology such as the Internet and computers. Students growing up in these areas, where poverty is high and generational, need expanded learning opportunities provided through emerging educational technology to bridge the gaps in the educational learning experiences available to them. If we expect students to use education as a way to move out of poverty, we must give them the kind of education and skills needed to do so. Better use of technology, in and outside the classroom, will broaden the educational experiences for these students and introduce them to a world of ubiquitous learning and a habit of using critical thinking skills in life, not just during a school period and inside a brick and mortar room. Alternatives to required seat-time and face-to-face classes may keep students from dropping out altogether and provide gifted students with exceptional learning opportunities.

According to the Annie E. Casey Foundation, *Kids Count Data Book 2012*, “[i]n 2000, the official child poverty rate, which is a conservative measure of economic hardship, was 17%. From 2000 to 2010, the number of children living in poverty jumped from 12.2 million to 15.7 million, an increase of nearly 30%. The additional 3.5 million children living in poverty is nearly equivalent to the entire
population of the city of Los Angeles" (AECF, 2012). In Kentucky those numbers have drastic consequences as well. Mitchell (2012) describes the poverty in Kentucky as detrimental to our students’ education citing a "26% poverty rate" which is 6% higher than the national average (Ledger Independent Graphic, 2012),

Mitchell (2012) describes the report as, “focus[ing] on indicators of education using the most current data for Kentucky and all 120 counties or 174 school districts, along with text that discusses up-to-date research and recommendations for improvement and addressed a comparison of low income to chronic absenteeism from school and educational difficulties” (Ledger Independent, 2012).

Mitchell (2012) further states that the report highlights, “Absenteeism often falls into categories of students unable to attend school due to illness, socioeconomic factors such as homelessness, or court involvement; those who will not attend out of fear of bullying, feeling unsafe going to and from school, harassment, or embarrassment; and students who do not attend because they or their families do not value education and make other things a priority” (Ledger Independent, 2012; Kids Count Data Book, 2012). Many of these highlighted problems, from absenteeism to making education a priority, could ideally be addressed through mirrored classrooms and the expanded learning opportunities they can provide. Students who drop out due to bullying, safety concerns, illness or poverty-related reasons may be able to stay in school and keep up with assignments if they can do so through online classroom work. In many ways, utilizing technology through mirrored online classrooms can help to alleviate the burden of poverty on children in Kentucky by
creating a new avenue to access education and thereby providing alternatives where no alternative presently exists.

The Promise Neighborhood grant through Berea College in Berea, Kentucky seeks to address the myriad of obstacles that Kentucky rural and poor students face. As an institution that has historically sought to lift Appalachian and minority students out of poverty through education, it is evident that technology use in the rural classroom may help to alleviate the problems associated with living in generational poverty.

In the meta analysis conducted by the U.S. Department of Education, Means, et.al., (2009) discovered positive trends for blended learning initiatives (p. ix). The overall findings of this large study shows that blended learning as it applies to a diverse demographic of students, including adult students, has positive effects as shown by a +0.24 increase in student outcomes (Means, et.al, 2009, p. 18). While this does not mean that an increase in student outcomes as shown in the study will be a cure-all for problems such as high dropout rates, it may mean that the often negative criticism of distance learning in K-12 is unfounded and based on preconceived assumptions of what the digital classroom can do.

The O'Dwyer, Carey and Kleimen (2007) study shows a +0.37 gain for students taking a blended course over an entirely face to face course. The O'Dwyer et al. (2007) study is significant because it found an online algebra class in Louisiana public school districts show “26.3% of public school students in Louisiana are enrolled in rural school districts” (p. 291).
Of this percentage, 31.7% of the students are classified as minority students and 21.5% live in poverty” (p. 291). This demographic of students is comparable to Kentucky student demographics of 20.4% poverty rate, 18.6% respectively (KDE, State Education Statistics, 2012). O’Dwyer et al.(2007) found that students in the Algebra study did perform better when assessed for student outcomes than the traditional face to face students even though the blended learning and online students reported less confidence in their learning (p. 303). The conclusion of the U.S. Department of Education study finds that 46 of 51 studies analyzed show that the use of online learning positively affects student outcomes over the traditional classroom (Means, et.al., 2009, p. 51).

It is evident that poverty and education are not mutually exclusive and that poverty and the resultant lack of access to highly qualified teachers and learning materials have a detrimental effect on students from high poverty schools. Initiatives that the Berea Promise Neighborhood project can provide, is a good first step in addressing these complicated problems in Kentucky. Giving teachers access to alternative sources for the classroom can help teachers provide the expanded learning opportunities to their students for snow days and pave the way for blended learning opportunities during all class times.

Example schools, such as the South Bronx Middle School in New York, Darke County Schools in Ohio, Barren County Schools in Kentucky and the successful Florida Virtual High School, all show significant improvement in student outcomes with specific regard to utilizing online classes for missed instructional time.
as well as providing an alternative to face to face traditional classroom models (Levy, 2011; Mackey & Horn, 2009, Wellsley, 2010; Innes, 2011).

Several studies have suggested that blended learning and online delivery of curriculum do improve drop-out rates and ameliorate the effects of poverty on educational attainment in rural areas. Studies such as the Sloan Consortium (2007) in K-12 Online Learning: A Survey of U.S. School District Administrators insist that better utilization of classroom technology, specifically distance learning, leads to better performance, increased retention rates and greater enrollments in post-secondary schools in students from rural and poverty areas. Picciano and Seaman (2010) describe the need for better utilization of distance and blended learning in K-12;

Rural schools are in the vanguard in offering online and blended learning programs to their students—using online courses to overcome significant problems in funding teacher certification, and small enrollments. Schools in all locales are facing serious challenges, but rural schools probably have the most difficult. Online and blended learning are a critical part of the strategy they are employing to deal with limited tax bases, low enrollments, and difficulty in attracting and keeping certified teachers. (p. 2)

Picciano and Seaman (2010) conclude that, “online learning and blended learning are making inroads into K-12 academic programs and most significantly at the secondary level” (p. 24). Changing the perceptions and assumptions about moving to a blended learning initiative in K-12 Kentucky classrooms is
transformational and will require a focused buy-in from teachers, students, parents and administrators to implement not only the technology needed to accomplish this important task, but to change ingrained ideas about education and learning that have prevailed for centuries.

Many problem areas in Kentucky K-12 schools are the reason this capstone project and the ideas presented here were chosen. The positive benefits of every K-12 class having, at the very least, a mirrored digital site where handouts and information can be stored, is a significant step towards moving Kentucky classrooms into the 21st century. The shift in technology implementation in K-12 Kentucky schools proposed here can be implemented in pilot schools first while utilizing funds already tied to such transformational change requirements. Most changes needed for implementation of mirrored classrooms to address the specific issues of missed days can be done with free Web 2.0 tools or through the use of school-based learning management systems, such as Blackboard, already in place and underutilized. The free version of Blackboard on the Coursesites application was modeled in this capstone.

**Transformational Change**

The kind of change described here is transformational. Transformational change is defined in simple terms as change that occurs when practice is significantly changed or turned in a different direction (Kezar & Eckel, 2002; Gass, 2010). Gass (2010) states, “Transformational change is distinguished by radical breakthroughs in paradigms, beliefs and behavior” (para. 3). This new direction or change must be
such that the outcomes are positively affected by that change. When such change occurs, a transformation occurs as well that leads the organization towards better outcomes. Technology integration in K-12 as described in this capstone could lead Kentucky’s educational systems towards better outcomes for students, administrators and society. Transformational change is closely aligned with the concept of transformational learning and is described by Elias (1997) as, “the expansion of consciousness through the transformation of basic world view and specific capabilities of self” (as cited in Buchan, 2010, p. 156). Project Red is a newly founded organization seeking to change these prevailing ideas on how learning takes place and how best to utilize technology in K-12.

Project Red (2010) defines transformational change in quoting Arne Duncan, U.S. Secretary of Education as:

- Technology can play a huge role in increasing educational productivity, but not just as an add-on or for a high-tech reproduction of current practice. Again, we need to change the underlying processes to leverage the capabilities of technology. The military calls it a force multiplier. Better use of online learning, virtual schools, and other smart uses of technology is not so much about replacing educational roles as it is about giving each person the tools they need to be more successful—reducing wasted time, energy, and money.

By far, the best strategy for boosting productivity is to leverage transformational change in the educational system to improve outcomes for children. To do so, requires a fundamental rethinking of the structure and
delivery of education in the United States (Duncan, 2010, as cited in Project Red, 2010).

A "force multiplier" as mentioned in Project's Red's preface is defined in military terms as, "a capability that, when added to and employed by a combat force, significantly increases the combat potential of that force and thus enhances the probability of success (Groves, 2007). In the military, this could be something added to a combat force to make it stronger, such as technologically advanced weapons. Adapted to an educational definition, this idea could be explained in metaphorical terms such as, a force multiplier in an educational setting can be defined as technology, that when added to and employed by teachers and students, significantly increases the learning potential of the student and thus enhances the probability of success. Murphy (2010) describes this concept as "[a] force multiplier [that] allows someone to accomplish a task with dramatically greater effectiveness" (p. 1). Powell (1990) describes a force multiplier as, "a key element of U.S. doctrine that asserts we can fight with limited resources and win (p. 17). It is evident that nationwide, schools are increasingly in a fight for the future of student learning and effectiveness in their education and they are doing so with limited resources. The main goal of this capstone is to show that technology integration into the K-12 classroom can be a force multiplier that will give teachers leverage in the struggle to increase learning, critical thinking skills and achievement in Kentucky schools. Technology, that is in many cases free to use, can be implemented that will dramatically raise the leverage teachers and administrators have at their disposal to create an atmosphere of mastery
and ubiquitous learning in our K-12 classrooms. Through these educational technology force multipliers, teachers can literally bring the world to their students, even in rural high poverty areas that would otherwise never have these virtual opportunities. Examples of technology that can be used as a force multiplier are learning management systems such as Blackboard, Web 2.0 tools such as Quizlet, Animoto, Google Docs and many others.

The biggest obstacle to implementing this transformational change in Kentucky classrooms is based on several key false assumptions. Some of these false assumptions and perceived obstacles are that learning can only take place within a brick and mortar building and that creating a mirrored digital classroom is too technologically difficult for the average teacher. This project and the provided framework for implementing a classroom online will focus on ways to address these perceived obstacles and demonstrate that online learning in K-12 is a viable solution to the problems of school cancellations due to weather, illness, and unexpected events.

Additionally, this capstone may be able to address high paper usage and waste within K-12 schools and the lack of effective 21st century skills through the use of online learning. Finally, implementing ideas found in this framework may address entrenched problems in K-12 such as high drop-out rates and obstacles to high impact education due to poverty. Examples of educational technologies and Web 2.0 applications that can be used to address these issues will be provided such as, Facebook, learning management systems (LMS) such as Moodle or Blackboard,
Blogs, podcasts, Google documents, Wikispaces, streaming video, screencapture, digital storytelling and other relevant online resources.

Further, this project will provide a framework and examples for administrators and teachers to replicate when integrating distance learning in the K-12 classroom. This framework will provide easily understood resources and examples so that school systems in Kentucky can address the following through online technology:

- Addressing missed instructional time during snow days or other calamity absences.
- Simultaneously, integrating 21st century technology skills through the use of distance learning and thereby addressing specific technology requirements in Kentucky SB 1.
- Providing a seamless transition from high school to post-secondary through the better use of technology integration.
- Addressing various secondary issues such as high drop-out rates, post-secondary success rates, testing scores, quality of curriculum and better environmental practices such as reduction of paper waste.

There is no doubt that Kentucky schools will benefit when implementing this framework and the ideas on how to use mirrored classrooms online to address missed days and seat time due to unexpected closings. Kentucky can be on the forefront of a transformational change in education if this small step blossoms into a larger, more inclusive picture that will address not only how we navigate weather-related
absences, but how well we prepare our students for a vastly different future than the one for which we have previously equipped them.

Much of the research and literature today are supporting the use of distance learning in K-12 as a viable option to in-class instruction. With informed choices, educators can also enhance their face-to-face classroom instruction with interactive technologies that can also be adapted for use when school is cancelled due to weather related restrictions. Use of technologies such as various learning management systems and other synchronous and asynchronous methods such as Facebook, should be considered a first option when designing instruction that can be delivered outside of a traditional classroom setting.

Many school districts presently struggle with simultaneous issues, such as the loss of instructional time due to weather, coupled with the loss of funding if the time is not recovered. In Kentucky, schools are required to provide 177 days of instructional time and 185 days of staff time in an academic year to receive funding (Pendleton, 2011). Kentucky KRS 158.070 states,

According to the Kentucky Department of Education, “The minimum school term shall be one hundred eighty-five (185) days, including no less than the equivalent of one hundred seventy-five (175) six (6) hour instructional days” (KRS, 158.070, 2012). The concern of making up weather-related or calamity days connects with issues regarding set testing times in the spring. Knox County School System in Eastern Kentucky cancelled classes for 20 days due to weather in 2011 and was
required to make up instructional time before mandated testing began in the spring ("Snow days piling up," 2011).

Superintendent of Owsley county schools in Kentucky, Tim Bobrowski (2011) stated that students missed 25 instructional days during the 2009-2010 school year due to inclement weather. Owsley County is not alone when it comes to school days missed due to inclement weather conditions. Harlan County School district, in rural Eastern Kentucky, missed four days of classes in December, 2010, well before the worst of winter weather took place (Warren, 2010). A spokesperson from the Kentucky Department of Education commented, "You wonder what it's going to be like in January and February because those are the months when schools usually are out in Kentucky. And it's not just because of the weather; it's also because of the flu. And the flu season hasn't even started yet either" (as cited in Warren, 2010). Several school districts have incurred weather related cancellations of more than 20 days within a two-month timeframe (Warren, 2010).

The various cancellations cause students to miss much needed instructional time in the winter months and this directly affects student preparedness when testing time approaches in early spring. Lawrence County, Kentucky superintendent, Mike Armstrong suggested that this interruption of momentum had a negative effect on student test scores as he states, "It's just so hard to establish any sort of instructional momentum and learning momentum" (Hjalmarson, 2010).

The grant proposal for the $30 million dollar Berea College Promise Neighborhood focuses on education initiatives and takes special note that Kentucky
schools, especially in the most rural and poverty areas, are burdened with the loss of instructional time due to weather. According to the report, “The mountainous terrain means these roads are narrow and curvy, making for hazardous travel during inclement weather and, on average, our schools [Promise Neighborhood Districts] miss more than 25 instructional days each winter because of snow” (“Berea Promise,” 2010, p. 4). The Promise Neighborhood is presently putting in place technology measures such as making Blackboard available to teachers who wish to use it for snow days and other instructional support for their classrooms.

Mississinawa Schools in Darke County, Ohio are already utilizing online technology to address the snow days issue. Superintendent Lisa Wendal uses online delivery as an alternative option to using pre-calculated cancellation days. According to local reports, Mississinawa County schools require work to be posted in an online delivery system so that students can access any assignments missed on a cancelled day. Students then have up to two weeks to complete the snow day online assignments (Wellesley, 2010). This approach allows students to continue instruction uninterrupted through snow day cancellations while also utilizing technology skills that will prove beneficial in post-secondary education (Wellesley, 2010). Allowing students to submit snow day assignments within a specific time frame also anticipates problems some students may have with internet access. The two-week time frame, as proposed by Wellesley, allows students to make up the work online during a specific time period, much like an asynchronous online classroom. For students who do not
have Internet access on the day they miss school due to snow or any other reason, they can complete the work online within a specific amount of time.

Rutgers Preparatory School in New Jersey has likewise begun online delivery for snow day cancellations. Kevin Merges from Rutgers integrates technology into his high school math classes. Merges comments, "Rutgers Prep, like several other schools and districts around the nation, has been looking into online learning tools for the past five years or so. For the first time this year, all teachers from pre-kindergarten through 12th grade at the private school were required to have websites and learning material posted to Moodle" (Applebaum & Lee, 2011). Posting handouts, assignments and other paper-based learning material to a Learning Management System such as Moodle or Blackboard can save school thousands of dollars per year in paper and copier expense and that is usually thrown away after a very short time. Posting these "throw-away" assignments as a digital file also creates a vast repository of resources for both students and teachers to use over and over again.

The Florida Virtual High School (FLHS) is an exemplary model of a public K-12 school system utilizing available technology for the benefit of all students in the district. It was founded in 1997 and is the largest state supported online public school in the nation (FLVS Online, 2012). The school serves nearly 150,000 students in and out of state and has more than 300,000 half-credit enrollments, serving students seeking Advanced Placement or college credit courses not otherwise offered at their campus. These enrollments encompass more than 120 different classes, from
advanced course not offered on school campuses to recovery credits for students in
danger of dropping out to GED-track students who may even be taking the online
courses while incarcerated (FLVS Online, 2012).

Florida Virtual High School, “saves nearly $2200 per student” as compared to
students enrolled in face-to-face or traditional classrooms in the Florida public school
system (Shaw, 2012). Arthur Johnson, superintendent of Palm Beach County
Schools in Florida describes, “current practice in Florida Virtual School is that
courses are completed based on mastery, not seat time requirements” (Johnson, 2012,
p. 1). Allowing credits for mastery versus seat-time is an important transformational
change that must occur for mirrored, blended or online classes to be effective in the
K-12 classroom. Johnson describes mastery learning as, “an instructional method
that presumes all children can learn if they are provided with the appropriate learning
conditions and time. Specifically, mastery learning is a method whereby students are
not advanced to a subsequent learning objective until they demonstrate proficiency
with the current on[e] (Johnson, 2012, p.1).

Florida Virtual High School or FLVS, is now expanding into Blended
Learning for many classes on school campuses. These blended learning classes,
which may meet once or twice a week in a face-to face setting are currently used for
classes in 44 districts with 314 Virtual Learning Labs inside these schools (Davis,
2012). Preliminary data from blended learning courses in geometry and biology
found that scores, “were among the highest in the state” (Davis, 2012). Blended
Learning is possible with the use of a mirrored classroom as suggested in this
proposal. Utilizing technology such as a Blackboard digital classroom allows teachers to create a blended environment where much of the content, including video lecture, can be placed online. Actual face-to-face class time can then be used to reinforce the content through group learning experiences, question and answer periods and formal assessment.

In Kentucky, one school district is presently attempting the virtual high school model exemplified at Florida Virtual High School. Barren County Academy of Virtual and Expanded Learning (BAVEL) offers a Virtual curriculum provided through third party contract with the Florida Virtual High School. This virtual school also uses other resources from KET and post-secondary institutions stating:

The Barren Academy of Virtual and Expanded Learning (BAVEL) is a fully accredited, diploma granting public high school recognized by the Kentucky Department of Education. BAVEL curriculum is provided primarily by Florida Virtual Global Schools (FLVS) and Kentucky Education Television (KET), in addition to having partnerships with three Kentucky colleges and universities. Students may enroll in BAVEL to take core courses, Advanced Placement courses, dual credit courses, study foreign languages, accelerate their learning or to make up credits. All teachers hold state certifications and are well qualified. Courses meet state and national standards. (BAVEL, “Who We Are,” 2012).

Barren County Virtual School has been in existence since 2005 and 95 students have graduated from the virtual school (“Facts of Interest,” 2012). BAVEL has stayed the
course, with the expanded offerings it can now make available to Kentucky students, where the Kentucky Virtual High School is presently no longer accepting students. While this school is a model example of the ability of the 24/7 classroom to create positive transformational change in secondary education, Kentucky can do better by implementing an easy-to-use and free resource to teachers in all classes across the state. Mirrored classrooms can replicate and enhance every class a teacher teaches in the semester, whereas the BAVEL and FLVS offer a specific set of courses that can be taken to substitute for the required curriculum for graduation.

Kentucky superintendents are often under pressure to seek waivers from the State Department of Education for the mandatory make-up days when bad weather causes excessive school cancellations. Alternative measures involve cancelling spring break or extending the school year into the summer break. All of these approaches to addressing missed instructional time do not provide a seamless and uninterrupted flow of instruction such as distance learning can offer. Extending the school year or cancelling breaks and holidays does not necessarily make up for the instructional time lost when measured by student progress on testing. Any interruption of several days, as is the case in many rural Kentucky schools, can set students on a path to lower achievement based on the continual interruption alone. According to Kentucky Education Commissioner Terry Holiday (2010), “I also know how difficult the development of a school calendar can be and how difficult it is to schedule makeup days” (par. 3). Providing seamless distance learning and curriculum delivery online will alleviate the problems caused by snow day cancellations while providing other
educational and economic benefits at the same time. Other benefits to online learning include training students in the use of 21st century technology skills, saving money through the better use of technology and less use of paper and the possibility of monetary savings in all school departments if several days of instruction a year can be achieved online.

In a major study of online learning in K-12, the Sloane-C consortium surveyed 1,200 random school districts about how they implemented distance learning (Picciano and Seaman, 2007). The study found that most K-12 school districts only utilize online learning for the following reasons:

- Offering courses not otherwise available at the school
- Meeting the needs of specific groups of students
- Offering Advanced Placement or college-level courses
- Reducing scheduling conflicts for students
- Permitting students who failed a course to take it again. (Picciano and Seaman, 2007, p. 8)

None of the thousands of respondents who answered the survey described their school's usage of distance learning in terms of addressing lost instructional time, promoting the 21st century skills base or reducing paper consumption. In the Sloane-C study, most teachers and administrators seemed to view online learning as a separate sphere reserved for worst case scenarios where a student is ill and loses time in school or where advanced placement students seek to gain dual credit for post-secondary
admission (Picciano and Scaman, 2007). The prevalent thinking, as shown in this study, suggests that distance learning is seen primarily as an extra-curricular activity that can accommodate students only on the extreme ends of a spectrum where struggling students use it as a last resort and advanced students use it when they can supplement their face-to-face classrooms. This is evidence of a significant pattern of thinking by teachers, administrators and students alike, seeing distance learning as supplemental to classroom learning and not as a new way to deliver content that is on par with the traditional classroom.

Quillen (2012) describes this innovative way to deliver content as new, but with a small number of organizations and a “growing niche of schools looking for content, technical support, and conceptual guidance on mixing online instruction and face-to-face learning” (pg. 110). Quillen (2012) further explains that the exponential rise expected in K-12 education for learning management system providers and support along with educational consulting and instructional design support is an unmet and quickly growing need (p. 110). This growing need for support and guidance in K-12 is a guiding force behind this framework.

The South Bronx IS 339 Middle School in New York has integrated online learning by providing all students with laptops during and after school. This implementation has successfully raised academic performance in the school, reduced gang activity and alleviated discipline problems (Levy, 2011). In 2004, when Levy, the principal, took over the school, technology was not being used. Today, as part of the school’s commitment to online learning, the school has laptops in every class and
all students can study and send in homework online (Levy, 2011, "Frontline"). In the
years since Levy moved his school in a direction where more online learning is used
and available in classes, much success has been seen. It was reported that South
Bronx IS339 Middle School moved from, “22% of kids being on grade level in math
to 47%. Behavior improved, attendance increased, and suspension levels fell. Writing
volume and quality are both on the rise, and we anticipate seeing improved ELA
scores in 2009” (NYC IS339, 2009). Two major findings from the Google Apps
Case Study (2009) of Levy and Bronx Middle School IS 339 was that (1) teachers’
technological capabilities and actual use rose to new levels of competence, and (2)
clear communication across campus was established between students, teachers, staff,
and community using Google Apps (“NYC IS339,” 2009). Other initiatives to use
Apple products such as the iPad and iPad mini in class take advantage of the rapidly
growing area of Educational APPs provided by Apple and Android Educational
APPS provided by Android and Google.

**Green and Sustainability Benefits**

Many of the problems teachers and administrators identify as reasons not to
use technology in K-12 are based on perceptions of distance education and not on
concrete evidence. Along with providing alternative approaches to educational
content and delivery, school districts should seek to model green behavior and
promote socially responsible actions in the environment. A positive consequence of
moving K-12 to a more inclusive and integrative distance-learning curriculum is that
it will significantly impact the schools' carbon footprint. Reducing a school’s carbon footprint is an environmentally ethical stance to take and a third prong of the benefits of distance education. Hamann (2008) notes that “many education institutions are promoting social responsibility on campus by going green” (p. 40). Hamann (2008) further notes that “schools are major consumers and producers of waste, and many are assuming responsibility for instilling environmental values and practices in their students—the next generation of leaders—and serving as role models for their communities” (p. 40). Reducing paper consumption through efficient use of digital technology is one strategy that tackles this problem while promoting environmental awareness at the same time.

Hamann (2010) cites a Worldwatch institute report that states, "An average university with a campus population of 10,000 uses more than 1 million sheets of bond and letterhead paper each month" (p. 42). Translated into a district or a school’s cost savings, this could well generate enough savings to pay for technology and access needed for most students.

Sustainability and paper consumption is rapidly becoming an issue and discussion point in many K-12 schools. Going paperless is an attractive option for administrators for many reasons. K-12 schools are seeing paperless as a way to not only save school funds spent unnecessarily on paper waste, but also to model an environmental conscience to students who will live in a global environment that will need to address sustainability issues.
As long ago as 1997, K-12 teachers were seeing the possibilities of going paperless in the computer driven classroom. Hanna Rudnicki, from Lincoln School in Rhode Island, predicted that the use of internet based programs could easily lead to a paperless classroom in K-12. Rudnicki (1997) explained that, "I began my paperless classroom last spring and was unsure if the girls would respond positively to the idea, but I was pleasantly surprised as they excelled and began using the computer folders not only for their homework and tests, but to drop coded messages to friends, teachers, and advisors knowing the information was confidential" ("Paperless," 1997). Such a statement from 1997 when no effective LMS existed in K-12 is an eye-opening comment.

In a report on Moeller High School in Cincinnati, Jeff Gaier describes the paper use in one high school as reaching 2.2 million pages for the year 2010 (Artunian, 2010). The environmental impact of such paper use includes "84 gallons of oil" for every ton of paper and "16,000 pounds" of carbon, a substantial environmental impact for just one high school with approximately 1000 students (Artunian, 2010). Moeller High School administrators intend to use fewer printers to achieve a major reduction in paper use or using other computer based options to create a paperless environment in the high school. Former Superintendent Joe Davis estimates the new printers will drastically reduce paper waste as well as electricity with an estimated savings of $250,000 a year (Artunian, 2010).

Grant (2009) states that Kentucky schools spend an enormous amount of finances on energy and paper use in the 174 schools across the state. According to
Grant (2009), "Kentucky's 174 K-12 public school districts operate 1,243 buildings. Each school spends a big chunk of its annual budget on many different kinds of energy, including natural gas, fuels for school buses, and electricity. Together, all these school districts spent $187 million on all forms of energy during the 2007 fiscal year" (par. 1). Grant (2009) further describes Governor Beshear's emphasis on E2 (Energy Efficiency) as part of a sustainability issue for Kentucky, both monetary and environment. Grant (2009) states, "Money is the other big issue. Since the year 2000, total energy expenses for Kentucky's public schools have more than doubled" (par. 7).

More than 10 years ago in early 1998-1999, Stephanie Sorrell of Eminence Kentucky school district, sought to implement a paperless classroom in her 7th and 8th grade English classes with documented favorable results. The website, www.paperlessclassroom.org created by Sorrell is still available but has not been updated or revised since 2000. A search on the Kentucky paperless classroom using Google, Ebsunhost, Academic Search Premier, ERIC and Kentucky Department of Education only turns up brief citations of Sorrell's Eminence experiment, if at all, using Pocket PC's from more than 10 years ago. After a search on the Kentucky Department of Education website, three schools are listed as having requested technology specifically on applications for School Improvement Funds that will directly affect the paperless classroom. Hardin, Taylor and Jefferson county schools all directly requested and mentioned the paperless classroom for 2010-2011 improvement requests. None of the requests involved the use of an LMS system such
as Blackboard to enhance a paperless environment (KDE, 2012, “Paperless Classrooms Search”).

Kentucky can move to the forefront of digital content delivery and save money at the same time through the implementation of a paperless classroom. Students will likely notice that at the end of the day there are no handouts strewing the hallways and blowing in parking lots as is often the case when class ends every single day in our schools. Teachers may notice they no longer stand in long lines at the copier station to make hundreds of handouts that will ultimately find their way to those hallways, floors, parking lots and trash cans across campus. This type of waste is unnecessary and does not model an environmental awareness or sustainability to students. The initial implementation of a mirrored classroom can easily transform a school into such a paperless environment and students will see a real world example of the impact that a modeled green and ethical behavior has on their school and their state.

**Industrial Age Education in a Digital Native World**

According to Tapscott (2009) in Growing Up Digital, “the model of education that still prevails today was designed for the Industrial Age. This might have been good for the mass production economy, but it doesn’t deliver for the challenges of the digital economy or for the Net Gen mind” (p. 122.) In the present economy, previous skills based upon rote memorization and testing are vanishing. These are being replaced with technologically advanced requirements coupled with the use of social media in everyday life and the workplace. K-12 must promote the use of these 21st
As Tapscott (2009) notes,

The Net Geners have grown up digital and they're living in the twenty-first century, but the education system in many places is lagging at least 100 years behind. The model of education that still prevails today was designed for the Industrial Age. It revolves around the teacher who delivers a one-size-fits-all, one-way lecture. The student, working alone, is expected to absorb the content delivered by the teacher. This might have been good for the mass production economy, but it doesn't deliver for challenges of the digital economy, or for the Net Gen mind (p. 122).

Resistance to the change technology affords in the classroom comes mostly from the perception that classrooms must continue to model the industrial age narrative. The digital age involves 21st century skills that include critical thinking and problem solving meshed with digital technology to further enhance those skills (Tapscott, 2009; Arora, 2009). Additional benefits to switching from the industrial age classroom include: increased communication, higher retention rates and even reducing the carbon footprint through less paper waste (Tapscott, 2009).

Picciano and Seaman (2007) provide an exhaustive study on the uses of online education in K-12. Even though the study is merely 4 years old, it may already be outdated in terms of what has transpired in recent K-12 technology use. Educational technology and its application in K-12 is expanding in such a way that relevant
research becomes dated material in a relatively short amount of time. Additionally, since educational technology is a rapidly evolving discipline, school systems need to provide updated hardware, software and professional development for teachers so they can stay current. Teachers need an easily accessible guide that will help them begin moving towards a classroom content delivery system that models the ability to provide digital resources without the constraints of time and space.

Levy’s (2011) transformational change at his school is supported by high achievement rates and increased collaboration among teachers who use technology. Technology turned the Bronx Middle School IS 339 from a low achieving school to a cutting edge higher performing school in a few short years. While Levy’s use of technology was not specifically implemented for use during weather related cancellations, his example is further evidence that such technology innovation can be beneficial in addressing academic achievement.

The Digital Divide

Most of the criticism against integrating technology into K-12 in a meaningful way is directly related to what is now described as “the digital divide.” Overall, 70% of the American population has some access to the Internet on a daily basis (Warf, 2010, p. 112). Warf (2010) states, “In a society increasingly shaped by digital technologies, lack of access to cyberspace becomes ever-more detrimental to social mobility, rendering those excluded from the Internet more vulnerable than ever before” (Graham, 2002 as cited in, Warf, 2010). Much like socioeconomic and
culture divides, the digital divide may be based on the same problems and principles and primarily, in Kentucky, due to economic disadvantage.

Brown (2005) describes the "technological inequities in the society at large", how this corresponds to "socioeconomic inequalities" and the impact of both on student achievement in K-12 (p. 29). Marx (1999) suggests that the promise of technology to reduce or eliminate injustices that stem from socioeconomic, racial and cultural inequalities is not supported by historical technological advances such as electricity and the railroad (p. 131-145). Marx goes on to state,

the chief lesson to be drawn from the history of technological innovation and its social consequences in the United States is largely cautionary. Although the new information technologies surely will help to effect many radical changes in our society, it would be foolish to rely on them as a "fix" for the afflictions of racial and economic injustice (p. 147).

Marx (1999) may be correct that the historical implications of technological advances such as mass communication and transportation did not entirely alleviate socioeconomic class divides, but an argument can be made that these advances did alleviate the burdens of everyday living and working for many lower class Americans. The burden in these cases was alleviated through the free or relatively free access to travel and communication.

In the case of educational technology, providing access to the digital highway is comparable to allowing people of all socioeconomic classes to freely use the interstate roadways or listen to broadcast radio and television with only the cost of the
traveling or listening device to be assumed by the consumer. In the case of education, students presently do not have to personally assume the cost of textbooks or the school building itself. Rather, a vicarious cost is paid through public taxes in order to provide K-12 education to its future citizens in a tax funded building. Providing internet access, devices to access digital information that take the place of the textbook and providing a learning space that is virtual rather than physical, is more about the "perception" of what constitutes a school than how a student learns or accesses the content delivered. The only difference between a virtual class or textbook is the implied need to conform to an outdated industrial age model that by all accounts is no longer sustainable or adequately provides the intended results.

Arguments against the adoption of online classes in K-12 are generally based on counterarguments related to:

- High speed internet access availability
- The Digital Divide- no access
- Lack of attendance due to no supervision
- Loss of child supervision during school hours.
- Technology skills of teachers

Many of the counterarguments against utilizing distance learning in K-12 are related to student access to technology and DSL Internet access. Arguments against using an online mirrored classroom for snow days may be alleviated using the models provided by Darke County schools in Ohio and Rutgers Preparatory schools in New
Jersey. Both schools allow students to complete the assignments during a specific time period, allowing students with little access time to complete assignments at locations other than at home. Assignments can be posted and students can complete assignments using the asynchronous model most used in post-secondary institutions. Money saved through less paper consumption or even through providing some courses completely online could be used to fund laptop rental programs or vouchers for low-income students to purchase internet access at home.

There are many possible solutions to transformational change through technology integration in K-12. As demonstrated at South Bronx Middle School, access to online learning through laptops is a viable solution and a green solution. Owsley County Schools in Kentucky are also seeking to demonstrate that addressing the issue of missed instructional time during closed school days due to weather can have multiple beneficial effects of reducing paper waste, providing students with a 21st century learning environment, and cultivating technology skills to bridge the gap to post-secondary education. Social media, such as Facebook and various Web 2.0 applications, the majority of which are free, can transform a school into a successful 21st century educational environment and promote environmentally conscious behavior at the same time.

The Divide in the Commonwealth

As online learning rapidly expands across the globe, Kentucky K-12 has been slow to join the digital revolution in the classroom. Due to economic, educational and cultural changes, technology is rapidly becoming an integral part of college
content delivery. This change leaves Kentucky K-12 students underprepared if they are not accustomed to a digital classroom before they enter a post-secondary institution. Further, most jobs that require less than a four year degree also require extensive knowledge of digital technology in the workplace (Tapscott 2009).

Distance learning in K-12 must be expanded in order to adequately prepare a new generation of learners for a 21st century education and workforce.

Spears and Tatroe (1997) discuss the need for rural access to distance learning and the impact it may have on poverty and education. While it is an older review of distance learning focusing on ITV use, this study is still relevant to the common obstacles of distance learning through Internet applications. Spears and Tatroe (1997) make an argument for increased collaboration between K-12 and postsecondary institutions regarding technology integration and seamless distance learning. Arora (2009) discusses the concept of K-12 online learning in a contemporary setting using anecdotal and statistical evidence to support the rapid interest and evolution of technology in K-12.

Payne (2005) discusses many educational issues regarding poverty and failure related to lack of resources and cultural impediments to learning. Technology can reduce or entirely eliminate many of these problem areas as defined by Payne (2005). As Payne (2005) points out, “two things that help move one out of poverty are education and relationships” (p. 3). Both of these integral points can be provided through the use of distance learning and technology in K-12.
TRANSFORMATIONAL CHANGE

Presently, Kentucky is 47th in internet accessibility for students, a dismal rating for our students (Couch, 2012). In the July, 2012 minutes for the Kentucky Task Force on Student Access to Technology, David Couch, Associate Commissioner for the Office of Educational Technology explains that,

"Thirty percent of students have experience with blended learning, which is up from 10 percent two years ago. A blended learning environment yields high results including an 81 percent increase in test scores, a 63 percent reduction in disciplinary action, and a 59 percent dropout rate reduction. Students have become more engaged with online collaboration. By using mobile devices, collaboration is no longer limited to face-to-face interaction. Students are able to use Skype, Facetime (sp), and other social networking applications to interact with their peers while working together on school projects. Sixty-nine percent of schools reported a drop in disciplinary action, and 62 percent reported a reduction in dropouts due to students' online collaboration. Regarding funding, Mr. said the majority of the funding sources for the technology initiatives come from school operating budget or capital budgets. Another source is state or federal grants. The major 1:1 mobile initiatives in Kentucky are based across 11 school districts, mainly in the high school level with some in the middle school level ("Task Force Minutes," 2012).

Couch (2012) further describes that Kentucky presently has "40 percent of homes having DSL internet access and 32.6 percent having cable modem, the ease of
home internet is increasing. Ninety-three percent of teachers have internet access at home. Seventy-nine percent of students in grades K-12 have a computer at home” (‘Task Force Minutes.’ 2012). He goes on to state that, “in 2010, roughly 22,000 students in K-12 had a smart phone device. That number jumped to 32,000 in 2011. The percentage of district-owned laptops, tablets, and mobile devices is primarily consumed by laptops at 68 percent. Seventy-eight percent of [Kentucky] teachers use a laptop as a portable instructional device” (Couch, 2012).

As noted in the map provided by the Commonwealth Office of Broadband Development, schools and students in the most rural counties of Kentucky, and with often the most underperforming achievement rates, also have the least access to digital information through broadband digital service. Underserved areas of Kentucky digital broadband access are shown in Figure 2.
In a report by Richard Innes (2011) titled, Digital Learning Now!: Obstacles to Implementation in Kentucky, an overview of digital initiatives in Kentucky is assessed. Innes (2011) summarizes, “Digital learning offers outstanding potential to enhance the educational performance and efficiency of public school programs in Kentucky and the nation” (p. 2). Innes (2011) describes the roadblocks for going digital in Kentucky schools as:
• Funding

• Problems with the data capacity and speed of Internet access (a ‘bandwidth’ issue),

• Availability of credible information on which programs work best and the costs of those programs,

• Accessibility to hardware and software and critical initial teacher training and on-going professional development to effectively employ these rapidly evolving tools, and

• Assessment design to foster better digital learning. (Innes, 2011, p. 2)

The biggest divide in Kentucky remains access to the Internet in rural and economically disadvantaged areas along with the ability to acquire a device to access a digital or broadband connection. According to the Kentucky Commonwealth Office of Broadband Development and Outreach, “91% or 3,890,000 Kentucky Citizens have access to broadband and 8.5% do not have access to broadband” (Kiser and Case, 2012, slide 9). Kiser and Case (2012) describe the disparity for Kentucky internet usage as a combined problem of a “perceived lack of need” along with inadequate availability and expense. Currently, the Kentucky Office of Broadband Development and Outreach has “received more than $5.3 million in grants for broadband mapping and outreach programs, including Broadband KY, from the federal American Recovery and Reinvestment Act (ARRA), State Broadband Data
Concerns over the funding and upkeep of a digital network in Kentucky schools does remain high on the list of negative futuring outcomes. Innes (2011) describes this concern as, “In general, Kentucky needs to identify and employ cost-efficient models of digital learning delivery throughout the state’s school system. Some programs available today are very expensive, but efficacy remains an elusive data point in the evaluation of many of these programs” (p. 23). Policy must exist that allows schools to implement virtual classes that will be counted for credit and equal to “seat-time” in the face-to-face setting. The design of a rapidly effective tool that many teachers can implement easily, cost-effectively and immediately, is part of the objective of this capstone project through the use of a course copy template through the free Blackboard Coursesites. Teachers and administrators can build on the foundation of a template ready-made for a mirrored class site that can be used rapidly in the case of snow day absences and concurrently to keep a digital classroom available to students 24/7. The cost savings of doing so through less paper waste, energy waste and the efficiency of moving to a digital classroom should outweigh the cost of professional development and enhanced digital networks. Research at Washington State schools has shown that digital learning environments can save up to 56% of the average cost of per pupil attendance (Innes, 2012; Finne, 2011).
Disruptive Technology

The use of the Internet, Web 2.0 and other technologies has been termed "disruptive technology" when describing its impact on students, teachers and education as a whole. Such disruption can be a path to transformational change that will propel Kentucky classrooms into a 21st century learning model. Christensen, Horn and Johnson (2008) describe this disruptive use of technology in the classroom 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" (as cited in Carmody, 2009, p. 267). Disruptive technology, such as using the Internet to address missed seat-time during snow days, is a disruption that can be seen as positive. The possible benefits of using technology, such as digital mirrored classroom, may alleviate immediate problems concerning missed school days and will also address many other problems simultaneously as suggested by data from several other school districts using aspects of disruptive technology and innovation such as internet access, iPad use and Web 2.0 tools including social media to encourage learning 24-7.

As Couch (2012) has described, the disruption of innovative technologies such as Smartphones are becoming such a commonplace possession that the perception of their "disruption" is rapidly diminishing and is replaced by the positive view that "disruption" can be beneficial if it disrupts practices in education that are in need of transformation. Disruptions of this type then become transformative and this can be seen in the positive data coming from studies where students can learn both
inside and outside the brick and mortar building. Smartphones, social media and the use of technology in a student's life is a cultural shift that shows no sign of slowing down. Instead of resisting this change, education must embrace disruptive technology in order for such transformation to effect positive change in the 21st century classroom.

The majority of studies presented in this literature review often come to a common conclusion based on the extraordinary and exponential advances in our ability to deliver classroom content and learning experiences to students regardless of time or space. This common conclusion infers that, at the very least, distance learning technology can successfully support the face-to-face classroom and may have the ability to completely revolutionize the K-12 classroom in a positive way.
Chapter 3

Methodology

Introduction

This project was developed based on an Action Research design model. Action research was originally described by Kurt Lewin and applied to educational intervention and change as well as social theory (Lewin, 1946; Grogan, et al, 2007). Grogan, et al describes the action research model as “a scientific approach to study the resolution of important social or organizational issues together with those who experience these issues directly” (Coghlan & Brannick, 2005, p. 4 as cited in Grogan, 2007). The problem and recommended solution as well as the final product in this capstone addressed these issues specifically in the context of an assumed collaborative response from teachers in Kentucky K-12 with regards to their direct experience of the problem statement.

Problem Statement

The problem question focused on in this capstone is how might Kentucky schools address the pressing issue of lost instructional time due to snow day cancellations, provide 21st century technology skills to students, and establish a model of environmentally sensitive behavior? Technology and distance learning in Kentucky K-12 are underused and could be integrated more efficiently to address several critical issues that may also raise the educational performance of Kentucky students. Research suggests that online learning and the use of Web 2.0 tools increase critical thinking skills while also providing 21st century technology skills to
students (Klopfer, Osterweil, Groff & Haas, 2009). All of these benefits are directly tied to Senate Bill 1 and the Kentucky standards initiative. This proposal sought to implement a framework for Kentucky school districts modeled new methods of curriculum delivery based upon evidence from educational research. The delivery methods involved distance learning and various technology driven tools that can be used in the traditional classroom as well as the online classroom. Models and procedures for creating the mirrored classroom are available on the attached CD with this capstone document from the Graduate School of Morehead State University.

This framework addressed the ongoing problem in Kentucky of lost instructional time due to snow days cancellations. Collaboration consisted of approaching the problem from individual doctoral research that culminated in a final proposed solution which incorporated ideas from each. Collaboration for this framework consisted of feedback from teachers and administrators within the Kentucky public school system and the Kentucky Community College System.

This project completed with an original framework and model for mirrored classrooms in K-12 with examples that can be distributed to Kentucky teachers and administrators to replicate.

Procedures

This study was based on qualitative research from existing studies and literature. The supporting evidence from these studies, such as the Berea College Promise Neighborhood Grant and other general statistical information from the Kentucky Department of Education and national studies such as Project Red and
others are used here to postulate the need for a greater implementation of technology integration in K-12 schools in Kentucky. The implications and direction of this study were used to design a framework for Kentucky K-12 teachers to use as a guide and model to build mirrored classrooms for their face-to-face classes.

Data was gathered and synthesized from several studies and databases discussed in the literature review. Data and statistical information specific to Kentucky was gleaned from the Kentucky Department of Education, the U. S. Census Bureau and survey, data and information from the Berea College Promise Neighborhood grant. The process for completing the framework followed the guidelines below.

- Review literature and best practices for implementing distance learning in K-12 to integrate into the final distance learning framework.
- Data was gathered on evidence from Kentucky schools regarding the present impact of missed instructional time due to school cancellations.
- Data and studies were analyzed from schools that presently use distance learning to address lost instructional time as well as utilize 21st century skills.
- Statistical evidence from the Promise Neighborhood Grant implies the need for expanded learning opportunities through blended learning technology and mirrored classrooms.
The framework for Kentucky administrators and teachers was created to use for a guide and replication based on the implications from this study of available literature and study.

The model Blackboard course was created as a visual guide and easily deployable template for Kentucky teachers to use in the beginning stages of technology integration in the K-12 classrooms.

Review of literature from relevant sources such as the Berea College Promise Neighborhood Grant, Project Red, the U.S Department of Education Meta-Analysis on Online education in K-12, iNACOL and others informed the creation of the written framework for teachers and administrators in K-12.

A written and digital framework was provided with this capstone to guide teachers and administrators in an easy to replicate manner, on how to create a mirrored classroom online. The researcher has significant experience creating online classrooms as well as education in instructional design and educational technology. The idea for creating a mirrored classroom evolved from personal experience as well as doctoral level class discussions on the problems associated with excessive absences in Kentucky schools for snow days cancellations due to weather.

The final products of this research project are the written capstone with Literature Review and References, a written Framework and guide for teachers to use and an online Blackboard Coursesite containing a model mirrored classroom along with original videos created by the researcher on how to perform basic Blackboard
functions to create the mirrored digital classroom. A DVD file for course copy
template is available at the end of the digital tutorials on the learning site.

After research and extensive literature review, it was determined that teachers
and administrators in Kentucky K-12 need a written guide along with a digital
example explaining how to create mirrored classrooms for this purpose. This
capstone began with the idea that teachers and administrators need an easy to use
tutorial and model example to quickly, efficiently and freely in most cases, create a
mirrored classroom. The written framework was written based on steps that need to
be taken by individual teachers or administrators to be sure that the mirrored
classroom can be effectively used for snow days and other educational support.
The framework was divided into five sections:

- Chapter 1- Beginning Questions-list of first things
- Chapter 2-Learning Management Systems
- Chapter 3- Instructional Design and Assessments
- Chapter 4-Implementation
- Chapter 5- Digital Resources

The Framework was written and published to DVD format. iBook publishing was
also used as a way to distribute the Framework widely to interested teachers as well.
Copies were added to the capstone written project and made available through
Morehead State University Graduate School.
A digital example course site that compliments the written Framework was also created and developed by the researcher. The free learning management system through Blackboard Coursesites was used. The researcher registered using a Morehead State email address and the example Course was created and titled KYSD13. All tutorials and resources on the digital site were created by the researcher and original MP4 videos created through the screencasting software Screen-Cast-O-Matic and copied to provided DVD. Screen cast videos of necessary functions were placed under the Resources and Tutorial tabs located and described on the Blackboard example site. The main page for the example course site can be seen in Figure 3.
Strategies for the created products consisted of:

- Research using the Morehead State Library EBSCO search and Academic Search Premier along with the Berea College Library Academic Search and Kentucky Virtual University.

- Other searches online in Google Scholar and Amazon for the latest written works on Distance and Blended Learning in K-12 were documented and accessed.
• The largest studies such as “Project Red” and the “Primer on Distance Learning,” through Pearson and the U.S. Department of Education, were used as a base to begin the research on the effectiveness of distance learning in K-12 which led to a greater understanding of schools that are using distance learning for reasons other than snow day’s cancellations.

• An Internet search of newspapers resulted in the small list of schools in the Midwest that are attempting to tackle snow days cancellations by replacing required seat time with online mastery of assignments.

• Smaller studies compiled on Kentucky distance learning were added.

• The literature review was compiled and written.

• A face-to-face consultation with the Director of Externally Funded Programs at Berea College to obtain statistical data from The Promise Neighborhood Grant was completed.

• An outline of a written Framework for creating a mirrored classroom was created based on researcher’s personal experience creating online classes.

• Two Blackboard shells using the free Coursesites were created to model an example mirrored course as well as provide a short course for teachers on how to begin creating and using a mirrored classroom.

• The Blackboard shells were designed so that one shell would be a learning and tutorial site while the other would be an exact replica of a snow day virtual class.
• Screencast-O-Matic was used to create screen cast videos of each major procedure needed to create a snow day class. Videos were uploaded to the “Start Here” section of the teacher instructional site and model best practice for instructional design for a class.

• A Youtube private channel was created to quickly and efficiently embed tutorial videos into the learning site.

• Screencast videos on how to use and create both the Screencast process and the Youtube site were made and uploaded to the tutorial site.

A DVD copy was created and made available with video instructions for teachers to save and import to their own Blackboard Coursesites mirrored class. This template can be used and the lesson sections edited for each individual use by teachers.

A focused effort was made to create the digital and written guide in a precise and an easily understood manner so that teachers who want to deploy an online lesson quickly could do so with written and video support and without the perception that creating an online class is too difficult or overwhelming. Great care was taken to create tutorials with the busy K-12 teacher in mind. The finished product, especially the downloadable course copy template will allow teachers to rapidly begin using an online mirrored classroom for snow days or any day.

During the research of the project, it quickly became apparent that the mirrored classroom could alleviate many other problems such as make-up work for
students battling illness, an alternative to behavioral absences or alternative schools, a possible safety net for students in danger of dropping out, addressing the cost and consumption of unnecessary high paper waste in districts and as an expanded learning opportunity for traditional classroom assignments.

It was also apparent after discussions with teachers in Berea Community School and teachers around the state that the majority of teachers would like to create a mirrored classroom but do not feel they have the necessary technology skills to do so. Further, many teachers have suggested informally that they do not have the perceived support from districts to begin using or creating a mirrored classroom.

For these reasons, a clear step by step process using video screencasting was chosen as the best way to disseminate important information and easily accessed demonstrations so that teachers or administrators with even minimal technological experience can easily replicate the example site. The site is also copied via Blackboard Course Copy and a tutorial is included on the site on how to import the zipped copy directly into a new course shell, eliminating the need to design the course from the generic created shell.

The written Framework and the example Blackboard Coursesite can be made available to any school or teacher requesting to be added to the course by emailing the author and creator at lajone01@moreheadstate.edu.

Finally this project culminated through presentation of its findings and recommendations to schools interested in utilizing distance learning to address missed instructional days and to better utilize technology resources in the classroom. A
printed model framework as well as a digital Blackboard Coursesite provided resources to the K-12 teacher and administrator who need a step by step guide towards using a mirrored classroom for missed school seat time.

**Evaluation Plan**

Successful completion of this proposal finalized in the completion of a framework and Blackboard model, suitable for replication and implementation in any K-12 classroom in Kentucky. Evaluations for framework were based on:

- Ease of replication of mirrored classrooms
- Level of interest from Kentucky school system administrators
- Level of interest from Kentucky school system teachers
- Implementation of technology in K-12 classrooms that utilize distance learning classroom models for blended learning specifically to address missed snow days as a pilot program.

**Limitations of Study**

The study was limited in scope to the beginning stages of designing a model of mirrored classrooms to alleviate snow day's cancellations in Kentucky schools. Further research is recommended after a period of time to gauge whether mirrored classrooms can adequately address snow-days cancellations and to provide more insight into the added benefits of mirrored classrooms in a blended environment. Data on the positive and negative consequences on student achievement should be documented and assessed. In the Meta-Analysis study used in this capstone project authors note that, "[t]he most unexpected finding was that an extensive initial search
of the published literature from 1996 through 2006 found no experimental or controlled quasi-experimental studies that both compared the learning effectiveness of online and face-to-face instruction for K–12 students and provided sufficient data for inclusion in a meta-analysis" (Means, et al., 2009, p.xii). Quantitative quasi-experimental studies should be implemented after schools in Kentucky begin implementing a blended learning model in classrooms that currently teach using the traditional model only.

Conclusion

Bringing 21st century technology into the K–12 classroom via digital learning management systems is an efficient way to address snow-days cancellations in Kentucky schools. Consequently, the technology used can be extended to create expanded learning opportunities that might not otherwise exist or be available to students in rural and poverty areas in Kentucky. Salman Khan, found and creator of the Khan Academy, a revolutionary, free online repository of instructional math tutorials describes this imperative change this way:

The old classroom model simply doesn’t fit our changing needs. It’s a fundamentally passive way of learning, while the world requires a more and more active processing of information. The old model is based on pushing students together in age-group batches with on-pace-fits-all curricula and hoping they pick something up along the way. It isn’t clear if that this was the best model one hundred years ago; it certainly isn’t anymore (Khan, 2012, p. 3).
The Literature Review and subsequent research led to the creation of the provided digital and written framework. Inferences were made regarding the positive benefits shown in schools such as the Florida Virtual High School, Darke County Schools and the Bronx Middle School, that creating a mirrored class site would alleviate the snow day cancellation issue in Kentucky and simultaneous bring Kentucky K-12 classrooms into a 21st century learning environment. Some of the criticisms of moving to a more blended technology in K-12 are access for students as well as professional development for teachers. Modeling the ease of use of the Khan academy and the success of the Florida Virtual High School, this project creates an easy to use guide and template for teachers in Kentucky to use initially for snow day’s cancellations. The digital guide and template are most beneficial for teachers who have relatively little online or technology skills. The repository of resources and the digital course copy will allow any Kentucky teacher to begin building a mirrored classroom with little prior knowledge.

The Khan Academy presently serves students in almost every country of the world and is modeling a revolution in the classroom through innovative use of technology readily and many times freely, available to educators today. It is time that Kentucky schools utilize this technology and deliver 21st century educational technology, classrooms and pedagogy to our students; for snow days, for everyday and beyond.
Chapter 4

Findings/ Future Identified Strategies

The findings and rationale for this capstone project are presented here. Originally, this project evolved from conversations with peers in the doctoral cohort who expressed concern that many school districts were having difficulty in their schools with snow day’s cancellations and the problems these sometimes long absences create for student and teachers. Many schools in Eastern Kentucky have excessive school closings due to weather related cancellations. This project was originally designed to alleviate the break in instruction when cancellations occur.

The research for this capstone and literature review has led to the creation of a written framework and digital model Blackboard course, specifically for use by Kentucky teachers who want to create a mirrored classroom online. Recent and preliminary studies presented in the literature review suggest that utilizing technology in the classroom with the use of digital technology that allows a 24/7 access to resources and collaboration may result in higher student test scores, fewer dropout rates and a sustainable green behavior that benefits school districts in many ways.

The statistical evidence from several school districts already utilizing online technology to address school cancellations effectively is compelling. A greater compelling argument to utilize distance education in Kentucky K-12 lies in the myriad of obstacles that Kentucky rural students face in their everyday lives which ultimately affects their education and their future as contributing members of the state and the country. The Berea Promise Neighborhood data is invaluable for its
description of the needs, especially in rural Kentucky for distance and blended learning initiatives. The child poverty rates in the three Promise Neighborhoods highlighted in the grant are at 36% for Clay County, 47% for Jackson County and 56% for Owsley County ("Berea Promise", 2010, p. 2). Such drastic poverty rates are detrimental to student outcomes in these areas and ultimately detrimental to the state of Kentucky.

Students in these low populated areas are less likely to have highly qualified teachers that retain employment in the schools and therefore less likely to have high quality learning experiences overall in their time at public school. Students from high poverty areas are also less likely to have the additional educational experiences that more affluent students enjoy such as going to museums or other educational activities through the summer or break times. Distance and blended learning can alleviate some of these inadequacies through the online delivery of courses and instructors not available in the face to face setting at their rural schools. Attendance and drop-out rates are statically higher for Kentucky students than average in the U.S., while post-secondary readiness and graduation are lower for these Kentucky counties ("Berea Promise, 2010, pp. 7-9).

Grade level reading and math levels for high school males and females in the Promise Neighborhood counties are a dismal 50% reading and 40% math for males and 64% reading and 30% math for females (p.6). The Berea College Promise Neighborhood Proposal (2010), postulates that:
The low number of students at or above grade level is strongly connected to the lack of rigorous instruction in our schools. During our planning year, intensive data gathering occurred to quantify the presence, or lack, of rigor within classrooms. Data gathering included instructional walkthroughs of classrooms in every school and at every grade level, interviews with teachers, administrators, students and parents and thorough review of student work as well as review of school level and individual student assessment results. (p. 6)

The distressing statistical evidence for many Kentucky districts, especially in high poverty areas, coupled with the overall positive conclusions for many studies on K-12 distance and blended initiatives in the classroom is the impetus for this capstone project. Initially, it was realized that mirrored classrooms can substitute effectively for lost seat time as shown in several examples from Ohio districts as well as full-fledged online high schools such as the Florida Virtual High School and the Barren County district in Kentucky. Mirrored classrooms used as a way to address missed school days during a snow day event can be the first step towards addressing a myriad of other urgent problems in Kentucky K-12 classrooms.

**Strategies**

The research question framed this project through an immediate need for a way to address excessive school cancellations due to snow day and other weather or calamity related reasons. The initial research question was three-pronged. The research question sought:
How might Kentucky schools address the issue of lost seat time due to school cancellations

- Provide 21st century technology skills to students
- Establish a model of environmentally sensitive behavior

It was determined that providing a way for teachers and administrators to provide students with expanded learning opportunities through the use of a digital mirrored classroom could not only alleviate the snow days problem in many districts but could also address other important needs simultaneously. Such needs and pressing educational problems as high dropout rates, high turnover rate for teachers, differentiation for low and high performing students, the weighty carbon footprint caused by unnecessary paper consumption and expanded access to class resources for the purpose of blended learning activities and flipped classrooms are just some of the ways that creating a mirrored classroom can enhance Kentucky classrooms.

A mirrored online classroom can deliver the same materials and assessments online during a snow day absence as would have to be made up when school resumes or by adding days to the school calendar. It was assumed here that the Kentucky Department of Education will allow school districts to count mirrored classroom work as fulfilling the requirement of "seat time" during such absences so that days need not to be added to the school calendar year, and thereby saving districts money and funding. An extended explanation of Seat Time versus Mastery Learning is discussed in the Literature Review section.
Based on the online teaching experience of the researcher, a literature review was conducted looking for the latest research and evidence within the last 5 years of online schools and the data that has been gathered on student achievement in online courses. Data for student achievement is relatively small as not many school districts are presently using online courses to replace seat time, but several studies support the preliminary evidence that online or blended classrooms can provide the same or superior learning opportunities for students.

Future strategy and research should revolve around creating the buy-in necessary from education officials, administrators, teachers, parents and students so that the digital classroom is not perceived as "disruptive" in nature or as a fad, but as a necessary component to providing a 21st century learning environment. One way to create such buy-in is through the development of learning materials using the same technology expected of the teachers and to cultivate a virtual atmosphere of collaboration where students, teachers and parents can actively work towards a more equitable educational experience through better technology use. This capstone sought to address these issues as primary importance. The written and digital framework provided achieved this first step goal.

Providing teachers with the necessary basic tools to begin using virtual mirrored classrooms is an important first step in this process. Most teachers do not have the time to learn how to use technology effectively on their own or in their spare time. Many teachers have voiced their concerns over the perception they hold that teaching online is much harder and requires more technical skill than can be
effectively managed while teaching full-time. As a teacher, I understand those concerns and have sought to make the template provided here as a fail-safe and easily replicated option for teachers who struggle with the technology skill or the time to implement and create their own digital classroom. The most important strategy of this project is to provide the foundational argument for why Kentucky K-12 needs to move to a blended learning environment but to also provide Kentucky teachers with the technological support they feel is lacking in their own professional development, especially when it comes to utilizing distance learning technology.

Process and Resources

The process for creating resources for Kentucky K-12 teachers to implement their own mirrored classrooms began with the teacher in mind. All resources were created in order for any teacher in Kentucky K-12 to begin using the mirrored classroom in a relatively short amount of time.

The process details are summarized here:

- Created a Blackboard Coursesites free account
- Created a course shell for Kentucky K-12 Teachers as a resource
- Created a course shell as a model Snowday online assignment
- Created original interactive content on teacher Snowday Template
- Created and narrated original screencasts on how to set up a Snowday online lesson
- Created and narrated original screencasts on a model lesson
• Created a course copy zip file on how to use the model lesson template
• Created a written guide/booklet to go along with the digital interactive guide
• Made digital coursesite, resources, model virtual lesson and written guide available on CD through the Graduate School of Morehead State University

Resources were provided through the Morehead State University Graduate School, to any Kentucky teacher or district interested in implementing an online mirrored lesson or mirrored classroom to support regular face-to-face activities. The expectation is that many districts will use the resource for professional development addressing online mirrored classrooms for K-12 teachers.
Chapter 5

Conclusions Implications Recommendations

In conclusion, this project has identified an easy to implement strategy to address snow day's cancellations in Kentucky K-12 classrooms that can be initiated at the teacher, school, district or state level. Individual teachers can use the Framework and the digital model as a guide to creating their own mirrored class site that can be deployed quickly in the event of a school cancellation.

Further, the individual teacher can use the site for a repository of lesson plans, resources or expanded learning opportunities for regular face-to-face classes. Teachers do not need an official school technology department to support or create the actual digital class. However, teachers will need administrative permission to create the site and should have adequate IT infrastructure at their school in order to create and upload resources, especially during planning periods during the school day. Teachers will also realize that without an official administrative school support of a Blackboard site, administration and enrollment of students will be the responsibility of the teacher. Blackboard helplines and technology support are provided through the free site.

The implications of utilizing a mirrored classroom for possibly every single K-12 classroom in Kentucky are enormous and major positive benefits can be predicted based on evidence in the literature reviews and preliminary evidence from studies proved there. Benefits for use in snow day's cancellations could be immediate with school districts able to keep the original school calendar days intact.
without resorting to extending the school year calendar into the summer break.

Possible cost savings in paper waste, textbook costs and other administrative costs could be astronomical and exponential when compared to evidence from the Florida Virtual School and other online initiatives across the county that claim a cost savings of up to 30% of what is normally spent per pupil. Paper waste savings alone in one school district could potentially purchase any mobile devices necessary for those students who need them. Cost savings over 10 years might fund technological advances as the technology expands and grows better and presumably cheaper to purchase.

The technology skills required to navigate a mirrored classroom using a learning management system such as Blackboard are invaluable to students who will enter a 21\textsuperscript{st} century workforce. Social media and the new art of finding relevant information in an information-overload world is a skill that will be in high demand in the new economy now and in the future. Blackboard assignments, especially those that involve paper assignments, demand good writing and communication skills while allowing students to reflect on what they and their peers have written. It promotes collaboration and Vygotskian social learning along with scaffolding in a way never imagined or possible before.

Students who would normally say nothing in a face-to-face setting do not have that option in the mirrored classroom. The mirrored classroom breaks this barrier as well. When shy or withdrawn students have the chance to share their thoughts through the safety of the Discussion Board, it ultimately helps them see the value of
their ideas and they become better students. Students will become adept at using online tools to work, research, learn and socialize in an effective manner when they are accustomed to it from kindergarten through post-secondary.

Perhaps the most exciting benefit of the implementation of mirrored classrooms in all Kentucky K-12 classrooms is the expanded learning opportunities that become available to students who may never have those experiences otherwise. Imagine a class of 10th grade English students in Eastern Kentucky connecting to a 10th grade English class in Ireland to discuss their common heritage through a study on the immigration of the Irish to Kentucky. These students could collaborate internationally on written assignments via Blackboard to learn more about each other, the technology and a culture much different than their own. Most students in Eastern Kentucky schools would never have the chance for such an experience otherwise. It is imperative that we give them the tools to access such expanded learning opportunities.

Teachers can use this framework and digital guide to replicate the digital classroom immediately. Administrators can use a pilot program of teachers in their districts to gather data on the effectiveness of providing a continuum of curriculum throughout a snow day absence as well as provide expanded learning opportunities throughout the academic year. Administrators should encourage teachers to begin thinking about the positive implications of going digital and going paperless when possible to do so and not just for snow day cancellations.

Possible negative outcomes to be considered might be:
• The continuing digital divide of student access and lack of resources

• Parental involvement- great need for parental buy-in and support

• Teacher buy-in and support- provide teachers with the necessary support and encouragement especially when lacking 21st century technology skills

• Address criticisms from parents, teachers and administrators on the perceived negative outcomes of moving to a blended learning environment

Recommendations

Because online and blended classrooms are still a relatively new concept in K-12 education, much study and research still needs to be done and documented. Many larger studies are presently ongoing and Kentucky can become part of pursuing this paradigm shift in education through an active support of creating mirrored digital classrooms in all K-12 classrooms.

Recommendations for further study are:

1. Implement pilot programs across the state where districts are funded with the necessary technology to use and loan to students who prove they have no access at home to technology devices or internet access.

2. Distribute the model Blackboard Coursesite template provided in this framework to Kentucky teachers to begin using mirrored classrooms for snow days a supplemental content delivery.
3. Compile data over two years with a cohort of pilot program students and teachers to assess achievement scores, ease of use, student/teacher satisfaction and unforeseen problem areas and to document the effectiveness of mirrored classrooms.

4. Apply for grant funding from various federal, state, business and non-profit sources for technology assistance for the pilot programs.

5. Request alternative definitions from Kentucky Department of Education regarding seat time requirements.

6. Define policy on how mirrored classroom assignments can replace seat time for part of the calendar year.

7. Disseminate this guided Framework to all districts for possible implementation.

8. Collaborate with the Commonwealth Office of Broadband Outreach and Development to obtain funding for digital broadband access across the state of Kentucky.

A primary conclusion of this capstone project, as well as many of the studies presented in the literature review, shows compelling evidence that our current educational system is struggling. Presently, we stand at the edge of a paradigm shift change in the way we think about learning and the way we deliver education. Our perception of where learning takes place is entirely different than it has been defined over the last 1000 years, due almost exclusively to the exponential growth of educational technology. Salman Khan, founder of the Khan Academy Online has
stated that nothing is more important than providing our students with the 21st century skills they will need to succeed in an ever-changing world economy that will be based on technology and the fluent use of it. Khan (2012) states, “At a time when unprecedented change demands unprecedented flexibility, conventional education continues to be brittle” (p. 180). This project assumes that Kentucky education cannot afford to be brittle when it comes to the future of our students and our state. Creating digital mirrored classrooms for Kentucky K-12 is the first step towards building a 21st century learning environment for our students, for ourselves.
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Appendix

A Companion Written Framework and Guide

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Chapter 1

Framework for Implementing a Mirrored Classroom

Pre Questions:

1. Do you have basic technology access at your school?
2. Do you have regular access to the internet at school/home?
3. Do your students have access? (Craft an informal questionnaire to students with administration permission)
4. Can you create buy-in from peers and administrators at your school?
5. Do you have basic technology skills such that email, posting and retrieving documents from the internet is comfortable?

The questions above might seem obvious, but many teachers and administrators do not really understand their school’s ability to support an mirrored classroom. Infrastructure is a primary need if your classroom or school decides to implement an online mirrored classroom. Access is another primary need, not only for students but for teachers as well. At minimum, all students will need a device at home to be able to access and submit posted assignments. This can be accomplished with desktop PC’s, laptops, IPads or Smartphones. Most students will have access to at least one of these devices when away from the school site. If you have a student who does not have access to any of these technology devices, it may be possible to
obtain one from your IT department or other community services as a loaner device for the student who has no access.

Other alternative access points are public libraries or churches with internet access. Some school districts choose to keep a computer lab open during cancellations or breaks so that students will still have the ability to access work via computers and free internet access. Wifi is also available free in many commercial sites such as McDonald’s and other restaurants.

If you have students without Internet access on a snow-day and can provide that student with the ability to access the Blackboard site, through a loaner device such as laptops or iPads, they can download assignments through one of these alternative free sites. Once the homework is downloaded, work can be saved and submitted either at the free alternative site, or on-site when returning to school. If you know ahead of time that a cancellation may be coming for the next school day, such as through weather reports, loaner devices could be on hand to give to those students with known technology needs in advance of the cancellation. These students could download the required readings or assignments and work on them at home using a loaner device and then submit at alternative free sites or upon return to school. In such cases, it is imperative that your school has on hand some loaner devices that can used by those students with proven financial inability to obtain the devices needed or who do not have access to the internet at home.

According to David Couch (2012), Associate Commissioner for Educational Technology in Kentucky, “Mr. Couch states that with 40 percent of homes having
DSL internet access and 32.6 percent having cable modem, the ease of home internet is increasing. Ninety-three percent of teachers have internet access at home. Seventy-nine percent of students in grades K-12 have a computer at home. Sixty-eight percent of those students' computers are less than five years old” (“Task Force Minutes, 2012). If 80% or more of students in your classes have internet access and computer devices, implementing an online mirrored classroom should be considered as a high priority.

Presently, there is much discussion about student access to computing devices as well as internet access. If you have students that do not have access from home, contact your principal or IT department for ideas on how you might obtain access for these students. Information on alternative access sites should be given to students who fall into this category, including local public libraries, churches or public places such as McDonalds’ that offer free Wifi access. It is imperative that teachers and administrators seek to fill the gaps in student device and internet access through state funding, grants or other sources so that all students can maintain expanded learning opportunities through the use of computer devices and internet access.

David Couch, Associate Commissioner of Educational Technology in Kentucky has noted that, “the smart phone devices have seen an increase in use and purchase as well. In 2010, roughly 22,000 students in K-12 had a smart phone device. That number jumped to 32,000 in 2011” (Couch, 2012). Most Smartphone, especially the Iphone now have the capability to access learning management systems such as Blackboard, Moodle or Edmodo. With all the possible options for access, the
number of students who have no access at all should be minimal and easily addressed through a school voucher or loaner device program. Many schools in Kentucky such as Woodford County and schools in the Berea Promise Neighborhood Grant are giving students access through the use of iPads in the classroom (Berea Promise Grant; , “Task Force Minutes,” 2012). These iPads can be accommodated through a technology fee for loss and obtained through various state or federal grants for your classroom. It is vitally important that all students have access to computer devices and internet access away from the school site in order for the mirrored classroom to effectively change the way Kentucky schools and Kentucky students deliver and access education. Talk to your IT department or your principal to ensure that all students in your classroom have adequate access to both.

Questions to ask your school administration before you begin implementing an online mirrored classroom:

1. Do I have access to high speed internet at school? At home?
2. Do my students have access to high speed internet access at school?
3. Do my students have access to high speed internet access at home or at a close public place? Ex: public libraries, churches, restaurants.
4. Do I have access on the internet through my IT department to use online sources such as YouTube or the Kahn Academy? Ask your IT department for access if not sure.
5. Do I have access to an online learning management system such as Blackboard?
6. If not, am I permitted to create my own site using a free Web 2.0 learning management system such as Blackboard Coursesites, Edmodo and others?

7. Do I need written permission from administrators, teacher leaders or parents to ask students to participate in a blended course that uses online technology?

8. Will all students be able to access the online material with a technology device, such as a laptop or Iphone, while not at the school site?

Once you have established whether you have the access to the internet and the permission to use an online mirrored class, be sure you are proficient in these technology skills:

- Ability to send and receive email
- Ability to attach and post documents to email and Blackboard site
- Ability to retrieve and open documents from email or Blackboard site
- Ability to navigate Blackboard or other Learning Management System. For Blackboard, see the digital companion to this framework at SnowDay Model Digital Template

Lastly, when implementing an online mirrored classroom, teachers and administrators should realize the limits afforded by going digital. In most cases, limits are only those set by your school administration or yourself in terms of what you want to provide to your student's digitally. Almost any class experience can be re-created in an online classroom using the latest Web 2.0 tools and other software applications. Limits are based on our own perceptions of what we can do outside of
the classroom or not. Sometimes those limits are imposed on us through lack of technical skills, lack of support or just a fear of the unknown. Distance education is rapidly becoming a standard in post-secondary education and is used more and more in K-12, especially at the high school level (Watts, 2010). It may be that teachers will not want to exactly recreate the present classroom experience in an online environment, but use it as a space for growth both as an educator and for our students.

Questions/Activities for Reflection:

1. Go to the Blackboard Coursesites found at this website: and complete the “First Things Session.”

2. Be sure that you can:
   
   - Secure permission from your school administration for a mirrored class
   - Email using an office school email account
   - Save handout documents to Word or PDF
   - Attach documents to an email
   - Open and receive attachments
   - Copy and paste URL’s to emails or pages in Blackboard
   - Watch the Getting Started Videos on the “First Things Session.”
Chapter 2

Which LMS?

Pre-Questions:

1. What is an LMS?
2. Creating your free mirrored class
3. Ethics and Legalities
4. Sign up and start your 21st century classroom

An LMS is short for Learning Management System. A learning management system is an online program where teachers and students can access and store documents, videos, assignments and respond via discussion boards to anyone enrolled in the course. Everything a teacher or student can do in the face-to-face classroom can be replicated in the LMS. For this project, the LMS, Blackboard will be used as a model. Many Kentucky K-12 schools presently have paid subscriptions to the Blackboard LMS. If you are not sure if your school has access to the paid Blackboard site, ask your technology department at the school. If you do have access to Blackboard through your school system, you will need the login to being creating your course/s.

According to the International Association for K-12 Online Learning (iNACOL), learning management systems can and should include the following capabilities:
• Communication is a combination of synchronous (i.e., real time) and asynchronous.

• Asynchronous communication tools include email and threaded discussions.

• Synchronous communication tools integrate video (sometimes via webcam), audio (including voice over IP), text chat, and whiteboard.

• Courses are often divided into lessons and units with much of the course material offered online. This course content may include text, graphics, video, audio, animations, and other interactive tools.

• Online assessments include different types of questions such as multiple choice, true/false, long and short answer, and matching, as well as project-based and performance-based assessments.

• Student activity online is usually tracked by the learning management system. (Wicks, 2010, pp. 22-24).

All of the components mentioned can be utilized using the LMS system Blackboard either with your school’s subscription service or free through the use of the Coursesites website. If you need to create your own Course Shell on Blackboard Coursesites you can watch the video Tutorial on how to this at:

If your school does not have a Blackboard subscription, you can still use Blackboard on the free site, Coursesites. You must remember that when you create your own classroom using any site such as Coursesites, Edmodo or any other free Web 2.0 site, you are the administrator of it. If your school has a subscription to
Blackboard then you will have on-campus Blackboard support from your campus technology department as well as from the Blackboard support site itself. When creating your own free site, you will only have the online Blackboard support at your disposal. You will also need to create and enroll students in your Blackboard courses. This process will be explained to you on the Web tutorial site created through this capstone project.

Creating the Mirrored Classroom

After you have been approved to create a mirrored class site through your school administration and identified an LMS system to use, preferably Blackboard, you will need to begin compiling your handouts, assignments, assessments and any other resource you would like to place on the mirrored site. If you are planning to use the site only for the occurrence of school cancellation due to weather related events, you can begin by creating the site on Blackboard and creating a “Snow Day Folder” there.

Inside the “Snow Day Folder” should be enough resources, readings, videos or assignments to correspond to assignments missed during a snow day absence. This can and probably should be, exactly the same assignments as you would have used for class if no cancellation occurred. If your handouts or assignments are not in digital format, meaning they are hard copies of assignments, you will first need to scan them into a format that can be uploaded to the Blackboard class site. If you have scanner/copiers at your school that can save to a flash drive, this might be the best option for saving these handouts in a digital form. Instead of copying them, you
will save them once to a flash drive and then upload them to your Blackboard Coursesite.

Think of your mirrored classroom as the place where not only your students can find the required documents and readings for your class, but also where you can compile your list of resources handouts, unit assignments, rubrics or any other valuable paper document that you presently have on hand. As a teacher myself, I know there are many handouts and assignments that I use that are connected to a specific unit or assignment. Other handouts that I have gathered over the years in hard copy form are sometimes forgotten and lost to me while remaining in a filing cabinet. When we change our perception of using digital copies rather than saving hard copy documents, we can create an easily searchable resource for ourselves and others, to use. Many teachers find that this is a great way to exchange classroom information with substitutes as well as students. Once we realize that going digital has so many benefits, including environmental and economic benefits, the incentive to use a mirrored classroom grows exponentially.

Ethics and Legal Responsibility

Remember that even though you may be interacting with students online in an asynchronous or synchronous setting, you are still required to abide by the laws governing education and our students. These include FERPA, ADA and any other school guidelines and rules for conduct, both for students and teachers. You should conduct your online communication, assignments and discussions among students with the same care and thought for the law as if you were in the face-to-face
classroom. This is especially true when it comes to privacy. You will want to be sure that your mirrored class site is password protected so that only your students in the class they are registered in can access the online mirrored classroom. This is a legal and imperative point of the use of online education so that students are protected from anyone outside the class accessing their work.

Below is a list of a few do’s and don’ts to follow when creating your mirrored classroom:

- Do create your mirrored classroom with a password specific to that class.
- Only give the password to the students enrolled in that class.
- Alternatively, only enroll students who are registered in the face-to-face class.
- Make the mirrored site unavailable when the semester or the class ends.
- Never post student responses, assignments, discussions or other class interactions on any public site such as Facebook.
- Posting student interaction on a public site constitutes a violation of FERPA and school administration rules.
- Use only publicly available videos that can be linked to your Blackboard site. Linking out to Youtube, ITunesU or other free sites is acceptable.
- Downloading, burning or illegal copying of videos is prohibited for the mirrored classroom.
- Create a list of rules for “net etiquette” that you discuss with your students before they access the mirrored classroom online. Include behavior that will
not be tolerated online such as bullying, vulgar language or other abusive conduct.

- These rules should necessarily be nearly the same as your face-to-face classroom rules.

Finally, be sure that you create an atmosphere of openness, collaborative learning and creativity in your mirrored classroom. Create a discussion board for questions and allow students to ask questions of each other. Create groups for collaboration online during snow days cancellations. Many students prefer the online classroom specifically because the atmosphere is more relaxed and conducive to learning than the pressure some students feel in the face-to-face setting. When students can respond to questions online in a more relaxed and reflective atmosphere, they often perform or out-perform what can be done in the brick and mortar classroom in a limited time period.

**Where do I go from here?**

Once you have gained permission to create your mirrored classroom and you have a reasonable amount of assignments, documents, resources for the class or unit you would like to place online, you should begin creating your mirrored classroom. If you have Blackboard access at your school, discuss the creation of a course shell with your IT department. If you do not have access to Blackboard, let’s begin with an overview of the free Coursesites Blackboard:
The website address for Coursesites is found at: https://www.coursesites.com

Once there you will see this page:

![COURSESITES](https://www.coursesites.com/wȠppu/tb-sites-course-creation-ssel1m33/pages/index.html)

**Move Your Courses Online Free**

Introducing The New CourseSites
- Create up to 5 course websites, free.
- Engage students in social learning.
- Weave multimedia into class content.
- Assess performance and manage grades.
- Share Open Education Resources.

**Figure 1. ScreenCapture Coursesites Login Page**

**Sign up Process**

The sign up process for creating your free Blackboard Coursesites is easy. Be sure to watch the supplemental video tutorials on the tutorial site provided with this project. After clicking on the sign up button, begin by giving your information. Be sure to use your school email if you use this email regularly. If not, then use the email account that you use most often. You will be asked to sign up using your own...
name. You should create a User name and password that are easily remembered.
You will want to create a Username that is acceptable in a professional setting.
Usernames such as Superman48 or Wonderwoman29 are discouraged. Instead, create
a Username that is a depiction of your class. Examples might be:
MadisonWriting2012-13 or JeffersonMathGRD9-10. This will also help you
manage your sites if you create more than one Course site. Be sure your password is
easily remembered.

Coursesites states that “there is no limit to the amount of sites you can create
for free” (Coursesites, 2012). However, you can only have 5 available at any one time.
For most K-12 teachers 5 concurrent classes will most likely be enough. In that case
you will need to create your daily classes by class name in the Coursesites system.

Be sure to create your Course Name so that you can easily find the course you
are looking for in a list of up to 5. In this case, you may want to name them for your
class periods. An example might be Writing-Perl-Grd9 or any combination that will
let you easily determine which class you are working on. You may have an
institutional name that is used on reports at your school for each particular class that
you teach. In that case, you may want to create your courses with the same
abbreviated name as what you use in your regular school reports. Ask your school
administration to be sure.

Once you have finished this section, you will be asked if you wish to enroll
students at this time. You may want to skip this section for the time being until you
have created the course with the design, assignments and other resources you plan to use. Students can be added and enrolled at a later time.

Questions/Activities for Reflection:

1. Do I understand the basic concept of what an LMS does?

2. Do I have the handouts, assignments or resources I need to post to the mirrored classroom on a flash drive or in a digital form I can upload to my mirrored classroom?

3. Am I comfortable with the legal and ethical responsibilities of the online classroom?

4. Watch the Chapter 2 video tutorials and access the resource links at https://www.coursesites.com
Chapter 3

Instructional Design using Web 2.0

Backwards Design and the Mirrored Classroom

Since you will initially be using the mirrored digital classroom as a place for your students to keep current on assignments through snow day or other calamity cancellations, you will already have an idea on what your lesson objectives will be for the days students will be out of school. Most likely this will follow the unit plan or lesson plans you have already in place before the cancellation occurs.

The basics of backward design are so that you can design your assignments on the goals you wish to be achieved for the time period stated. Jones, Vernetta & Jones (2009), describes backwards design or backwards planning as "concept based unit design format known as "backwards planning." Backwards planning calls for educators to begin with a nominal list of essential questions all students must answer by the end of the unit" (p. 357). Backwards planning may be especially efficient for course design in an online mirrored classroom due to its flexibility and focus on creating activities designed to lead to mastery of a topic, concept or unit.

Many lesson plans are designed for the face-to-face classroom such that certain material is expected to be delivered within a certain time frame and usually within the context of a textbook outline or with standardized testing requirements in mind. Material is delivered by lecture and modeling and then assessments follow. Backwards design looks at this process in what amounts to a “backwards” fashion. Decide what your students should learn at the end of the online assignments. Part of
this objective will necessarily be that students will remain current in the class throughout the absence from campus.

**Web 2.0**

Web 2.0 is the term used to describe the use of any digital software via a computer or other mobile technology device. Web 2.0 does not have to be educational in nature but many times Web 2.0 applications or software can be both entertaining and educational at the same time. The main objective for using Web 2.0 is to enhance and support your lesson plans and content delivery. Applications such as Google docs are not meant to take the place of a teacher or even replicate the face-to-face classroom. Many writing teachers use Google docs to support and enhance their face-to-face classes without every using a learning management system such as Blackboard to make their classes digitally available. A resource of Web 2.0 tools that you can use, often freely, will be provided in Chapter 5 as well as on the model Blackboard Coursesite.

Web 2.0 tools, including the Blackboard mirror coursesite itself, should be used to enhance instruction and learning digitally. Ways to use Web 2.0 tools in your classroom are to compile videos, webquests, discussion and sharing forums that will lead to the ultimate mastery assessment when lesson activities are completed. Free applications such as Google docs, allow you and your students to store, retrieve, edit, revise and collaborate on writing assignments from anywhere. Google docs can often be used in place of the expensive Microsoft Word for word processing capabilities.
Alternatively, you can even record your lecture or modeling examples and post this as a video to the mirrored classroom if you choose. Recording the computer screen as you are explaining or modeling a concept is called “screencasting” and can be done freely and relatively easily. The created videos can be used over and over again, resulting in a repository of lectures and models that are original to the teacher. Explanations on how to accomplish this will be described on the model Coursesites as well as links to resources at the end of this framework. A backwards design lesson plan is included in the Appendix. A “digital Bloom’s Taxonomy” as shown by Penn State is depicted in Figure 2.

![Bloom's Digital Pyramid](image)

Figure 2. Edel-Malizia, S., & Patel, R.(2011). (Graphic Illustration Bloom’s Digital Pyramid). Moving forward with backward design. *Sloan-C International Conference*
This taxonomy is based on the use of digital educational technology tools. Most of
the free tools shown here can be used to address Bloom's taxonomy of higher order
thinking and assessment of that higher order thinking. Many of the Web 2.0 tools
shown here, are also free to use in an educational setting.

Backwards design, lesson planning with the end in mind at the beginning, is
very important when designing your snow day's lessons online or when designing a
mirrored classroom online. The vast amount of possibilities, Web 2.0 tools and
digital lesson plans are endless and ultimately overwhelming. When you design your
class with the end in mind you can build or scaffold your lessons utilizing technology
for the specific goals and objectives for the digital lesson. Otherwise, you will be
attempting to use a vast array of educational technology tools that can quickly
become overwhelming for you and your students.

Constructivist Modeled Assignments

An erroneous assumption of the online or mirrored classroom is that no
teacher is needed if the computer does all the work. This assumption is patently false.
In a situation where students will be expected to substitute 'seat time' for mastery
learning, a teacher becomes even more relevant and important to the learning
experience, especially in an online or blended learning classroom.

Dede and Richards (2012) describes the difference between a behaviorist
classroom and a constructivist classroom as a major element of designing an effective
mirrored classroom. Class assessments based on behaviorist theory will necessarily be rigid and when placed in an online setting, will most likely include only multiple choice, true or false or other questions that require the "right" answer (p. 2). The constructivist model is vastly different and more suited to the online classroom. Dede and Richards (2012) describe the constructivist model as vital to "deep learning" and requiring "more open response from students, such as writing, project work, brainstorming, problem solving, creativity, invention and so on" (pp. 2-3).

According to Dede and Richards (2012), "Open responses cannot be effectively evaluated by computer, so a system that supports deep learning requires the diagnostic presence of a teacher in the classroom" (p. 3). Using constructivist models in the mirrored classroom can create these deep learning assessments that can support students in higher order thinking skills, especially in the online mirrored classroom. The mirrored classroom can even be seen as a model for the Vygotskian scaffolding that pushes students outside the zone of proximal development and into a deeper understanding of the material and assessments given (Duffy & Jonassen, 1992). Teachers utilizing online technology, especially when using the mirrored classroom as a replacement for missed seat time, should model classroom assessments and design on the constructivist model.

According to Duffy and Jonassen, (2012), "How effective or instrumental the learner's knowledge structure is in facilitating thinking in the content field is the measure of learning" (p. 22). Assessments used in the mirrored classroom should be designed based on these constructivist principles: open-ended questions, essay
questions, web quests, projects including video or storyboards, creative collaboration, writing collaboration using Web 2.0 tools such as Google Docs, image storytelling or manipulation using VoiceThread and other higher order thinking evaluative assessments of learning.

**What does a Constructivist Assignment Look Like?**

In the Learning Management System, Blackboard Coursesites, teachers have the ability to choose the “Constructivist” theme for the online mirrored course. As designer of the course you do not have to choose this theme but can make your Snow Day assignments based on a constructivist model by making sure you include these points:

- Create assignments that require open-ended or extended answers
- Create Discussion Forums where students answer questions or help each other answer the questions during the cancellation
- Create groups ahead of time and add at least one higher performing student to each group
- Include assessments that allow for student reflection and peer to peer evaluation
- Act as a guide that begins the discussion or assignment topic and allow your students to breakout into groups or work on their own towards a final project
- Add reflection assessments that will ask students to evaluate their work as well as the work of their peers
• Allow students to negotiate the requirements of the final assessment, especially if it involves a group project


Further, Koohang (2009) argues that teachers should design the virtual classroom with at least three elements in mind. These are:

• The Design of Learning Activities

• Learning Assessment

• Instructor’s Roles (Koohang, 2009, p. 94)

Koohang (2009) goes on to state that, “collaboration, cooperation, multiple perspectives, real world examples, scaffolding, self-reflection, multiple representations and social negotiation” should be part of online course design (p. 94). Teachers will assume the constructivist role of guide, mentor and coach and not necessarily the “sage on the state.” The stage no longer exists in a mirrored virtual classroom. Instead, students are expected and encouraged to use their critical
transformational change thinking skills, their research skills and their social collaborative and negotiation skills to pursue answers to questions that should ultimately push them higher in their educational level comfort zone.

Davidson and Goldberg (2009) describe this as "participatory learning." Participatory Learning is the educational process of learning through shared experience, and through a creative use of the technology and digital resources available to both teachers and students. Davidson and Goldberg (2009) describe this process as, "learners use new technologies to participate in virtual communities where they share ideas, comment on one another’s projects, and plan, design, implement, advance or simply discuss their practices, goals and ideas together" (p. 12). The idea of learning "together" here is a paradigm shift from our present educational system that asks students to become passive receivers of knowledge from an expert.

The kind of classrooms that sprout under the conditions of participatory learning become places of creative learning, an active symbiotic space where all learners are part of the learning experience and not merely passive vessels waiting for knowledge transfer to occur. As we see in the high dropout rates for the United States, often close to 35%, this passive transfer may be detrimental to student achievement and persistence (Davidson and Goldberg, 2009, pp. 12,). Participatory learning has the potential to allow students to access the world of knowledge that exists in the virtual classroom and to work creatively as part of a team of learners that succeed together towards mastering subjects rather than learning rote memorization skills.
Examples of a Participatory Assignment in Blackboard

A model of the process for participatory learning or a constructivist based assignment is shown below. The main goal of the lesson or assignment is to allow students to work together to master the problem or assignment posed in the beginning by the teacher. Scaffolding in the middle is based on student input and collaborative work with each other, using the teacher or the MKO (more knowledgeable other) as a guide through the process.

Figure 3. Jones, (2012) Participatory Learning Model
As an example we will use a 3 day lesson for a 10th Grade English/Language Arts class that could be used to replace seat time lost for a 3 day snow cancellation. All points listed below are shown on the example site along with videos and other resources to help you create your mirrored classroom.

The steps you may want to follow are described below:

1. Describe your topic and objectives for the mirrored class assignment on the Assignment Tab. (See example at www.coursesites.com. (You will need to email lajone01@moreheadstate.edu to sign in with the provided login)

2. Identify the final assessment and how you will evaluate mastery of the assignment. *For this sample lesson, students should write a 2 page research summary on symbols in the poem, “The Raven.”

3. Create Discussion Boards for the initial Brainstorming for the assignment and then another Discussion Board for reflection

4. Post the initial assignment and ask students to work as a large group or divide them into smaller groups in the Blackboard group sections.

5. Ask students to write out and discuss their brainstorming ideas for day one on the Discussion Board.

6. Monitor the discussion board on day 1 and give written guidance to questions or comments as needed

7. Ask students to post research findings for the Main Idea question to the Discussion Board as links or videos.

8. Encourage students to decide how they will present their findings
9. Ask students to post first drafts in groups to the Discussion Board for Day 2

10. Identify groups and ask students to trade first drafts for peer review and evaluation

11. Ask students or groups to use the peer review comments to revise their drafts and work collaboratively to edit for the final assessment.

12. Allow students to add images, videos they make or other creative additions to the original assignment of 2 pages.

13. Ask students to explain in detail how they created the final product as a written description on the discussion board.

14. Evaluate group papers and post feedback and grades to Blackboard

For other disciplines, revise the lesson plan above to fit the assignment. Math assignments can be made into timed quizzes in Blackboard and links to videos that model math problems can be embedded into the mirrored classroom. See Resources link on the example Coursesite at www.coursesites.com.

As you create snow days assignments in your mirrored classroom you will begin building a repository of resources that can be used over and over again. It may be possible for you to create a discipline or school wide sharing course on Blackboard so that teachers can share resources and lesson plan ideas with each other, especially for any snow day cancellation. Teachers may find that they can "team teach" on Blackboard when using the mirrored classroom for cancellations and can allow students to collaborate between disciplines when appropriate. This could add an even
higher level of expanded learning to the digital classroom and create more opportunities for critical thinking activities to occur outside the face-to-face class.

Questions/Activities for Reflection:

1. See the example lesson plans on the model Blackboard site at www.coursesites.com

2. Watch videos on how to create Discussion Boards for your mirrored classroom.

3. Think about a 3 day lesson plan that you might create for a snow day cancellation and compile a list of resources needed for the lesson.

4. Write out your plan and the steps you would need to perform on a Blackboard site.

5. Create a Rubric for the mastery assignment for the completion of the mirrored course. Use the free Web 2.0 tool Rubistar if you do not have digital rubrics already available at: http://rubistar.4teachers.org/
Chapter 4

Implementation and Implications in K-12

Many times the question comes up regarding technology integration in K-12 that teachers will not be needed or students will not want to come to school if they can complete their assignments at home. The perception here is that digital mirrored classrooms can “replace” the traditional face-to-face class. The digital class will not and should not replace the face-to-face classroom, but can enhance, support and expand the traditional classroom. Teachers who integrate technology into a mirrored or blended learning classroom, are needed more for scaffolding the learning material and as a guide for student-centered learning. Technology acts as a support or even as the scaffolding itself, providing expanded learning opportunities and the chance to use critical thinking skills in a way not possible without the technology support.

Teachers often have a difficult task when it comes to differentiation for students with learning disabilities, physical disabilities or who are just struggling with a concept. Having the ability to record lectures, post discussions and resources in a 24/7 learning management system provides teachers with support and expanded learning opportunities for students who might otherwise never receive the more personalized learning experience. Students who need intensive tutoring or mentoring may benefit from Web 2.0 tools that allow teachers, tutors or teaching assistants to virtually explain questions in the classroom or from a distance. Skype and other applications allow mentors and teachers to model explanations and feedback to students without the restraints of time or space. Web repositories such as the Khan
Academy are providing a free video library that models almost every Math, Science and Physics problem students need to learn in K-12. Students can free watch these videos over and over at their convenience when working out math and science problems at home. These videos and others found on free sites such as TeacherTube, Youtube, iTunes University and others can be embedded or linked directly into course content on a learning management system such as Blackboard or Moodle.

According to Rice (2012), “Quality online instruction is the most important factor in the quality of online learning experiences for students” (p. x). Rice (2012) lists key points on what teachers in an online or blended classroom environment should focus on:

- Subject matter expertise and understanding of how students learn
- Effective strategies to engage students in the learning process
- Problem solving, writing, analysis, synthesis (Bloom’s higher order)
- Interaction among students
- Managing discussion boards
- Providing feedback
- Setting clear expectations
- Using data to personalize instruction
- Guide the learning process
- Use technology effectively (Rice, 2012, p. x).
K-12 teachers are already proficient in many of these strategies in the face-to-face setting. The perceived obstacle is that moving these strategies to the virtual world is too difficult or time consuming. This may be a false perception that is easily dispelled with adequate support and resources for teachers.

**Implications**

Teachers and administrators should seek to define the digital classroom in a way that is different than the current perception of “replacing” the traditional class. Digital classrooms will support and enhance our traditional models and will not replace them in the strict definition of this idea. As more and more classrooms are digitally enhanced, this false perception and many of the negative criticisms that go along with it will likely vanish.

When you begin utilizing your mirrored classroom in K-12 there are several points you will want to keep in mind. You will still be the teacher. You will still be required to assess your students based on the core standards for your discipline and for the State of Kentucky. As you become more proficient developing, designing and implementing your lesson plans, you will want to include the ties to the common core standards directly into the LMS site. As an educator, your ability to “lead” your students in their educational experience becomes even more important. Lecturing and rote memorization will become less important as the mirrored digital classroom becomes an incubator for critical thinking, research, collaboration, discussion, reflection and creation.
Lastly, you will want to keep in mind that education is on the edge of a major shift from the way we have viewed learning and content delivery with the use of digital technology. Educators are learning what works and what does not work by simply trying out a new technology or Web 2.0 and then reflecting and revising the use in class or online according to student achievement or feedback. There is no completely right or wrong way to utilize an online classroom. There is only the question, does it work to achieve my objectives and increase student understanding and achievement? If your mirrored classroom can achieve this with minimal disruption to yourself and your students while maximizes access to resources and expanded learning, then your class will necessarily be successful.

<table>
<thead>
<tr>
<th>Final Checklist for First Things</th>
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<tbody>
<tr>
<td>Obtain permission to use mirrored classroom</td>
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<tr>
<td>Survey students for home or community access</td>
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<tr>
<td>to the internet and computer or mobile device</td>
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<tr>
<td>Gather/create digital materials for online lesson</td>
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<tr>
<td>or unit</td>
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<tr>
<td>Access the model coursesite provided in this</td>
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<tr>
<td>framework</td>
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<tr>
<td>Read all sections and watch video tutorials on</td>
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<tr>
<td>Example Site</td>
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<td>--------------</td>
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<tr>
<td>Create Coursesite for your mirrored classroom/s</td>
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<tr>
<td>Coursecopy the Blackboard template as described on the tutorial or create your own class site manually</td>
</tr>
<tr>
<td>Post Syllabus, handouts and related materials to Coursesite</td>
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<tr>
<td>Research the resources section and find one or two Web 2.0 tools that you might incorporate into your mirrored class</td>
</tr>
<tr>
<td>Enroll students by email address with a password into your mirrored class as shown in the video tutorials on the example site</td>
</tr>
<tr>
<td>Facilitate, monitor and grade Discussion Boards, assignments and/or assessments</td>
</tr>
<tr>
<td>Practice effective communication via Discussion Boards or email</td>
</tr>
<tr>
<td>Allow creativity and open communication in your mirrored classroom</td>
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</tbody>
</table>

Figure 4. Checklist Graph
Chapter 5

Resources

Why Use Cloud Based Web 2.0?

Many teachers find it overwhelming to begin to think about using all the Web 2.0 tools and cloud-based applications that are out there on the web. The best advice is, do not approach Web 2.0 tools or the lists found here as a way to begin incorporating as many of these tools as you can into your courses. Instead, think about what your objectives are for your blended classroom and how you might integrate a few of these Web 2.0 technologies to support your teaching and learning activities. If you try to compile too many technology tools you will quickly become overwhelmed and unfortunately, so will your students. The tools will only support your good teaching and learning content. They will not teach or model the material. Cloud based applications usually do not require downloading software or require purchase.

Approach the use of these tools as a support for what you are already doing in your face-to-face or blended classroom. The famous quote from “Field of Dreams” is “if you build it, they will come.” This can be adopted for our mirrored classrooms to become, “if you think it, you can probably find a Web 2.0 tool that will allow you to achieve it.” This is most generally true. If you would like your students to collaborate virtually on a paper, there are free Web 2.0 tools that will allow your students to accomplish this. If you want to record your class lectures or modeling
examples, there are free tools that will let you accomplish this. What one teacher uses for English class might be used entirely differently for Math class. Truly, the only obstacle is the overwhelming abundance of free tools on the web that can be adapted and used for your specific class needs. The following resource list is a very small overview of the basics you can begin using for your own classroom needs. Web 2.0 technologies evolve every day and it is nearly impossible to keep up with the rapid and exponential changes occurring in the educational technology field. With these tools and access to the internet, not only do we deliver to our students the 21st century skills they will need in the global workforce, but we truly deliver them the world.

All resources listed here will be linked to the tab titled “Resources” on the Blackboard model Coursesite. Comments give general ideas on how you might use the tool in a mirrored classroom. This is not a comprehensive list, but these are many of the most likely choices you can use in a mirrored classroom.
Web 2.0 General Tools

Animoto: www.animoto.com

➢ Allows students to create original visual works using their own pictures or videos. Possible uses are digital visual storyboard, historical timeline or visual representations of written works.

Blackboard Coursesites: www.coursesites.com

➢ Free learning management system for up to 5 simultaneous courses. This site is the basis for our modeled mirrored classroom.

Facebook: www.facebook.com

➢ Use the social media application to create a private group where your students can share information. Be especially careful with this particular tool as students often abuse it including as an instrument for bullying.

Google Drive/GoogleDocs: www.docs.google.com

➢ Free collaborate document word processor. Use for collaborative documents or with students who may not have the Word software on their computer.


➢ Free video and chat conferencing for individuals or groups. Can serve as a video based virtual classroom if no learning management system is used.

PollEverywhere: http://www.polleverywhere.com/

➢ Instant survey, pop quiz, statistics maker.

Project Gutenberg: http://www.gutenberg.org/

➢ Free ebooks, copyright free. These are mostly the classics.
Quizlet: www.quizlet.com

➤ Free test, flash card and survey creator. Post link to created test into learning management system

Rubistar: http://rubistar.4teachers.org/index.php

➤ Create free rubrics, save and upload to Blackboard assignments

Skype: www.skype.com

➤ Free video conferencing tool. Use video to conference with students, tutoring and inviting guest speakers or team teach with educators from all over the world.

Screen-Cast-O-Matic: www.screencast-o-matic.com

➤ Free for the first 15 minutes, make recordings of your computer screen and your voice and/or video. Save and upload MP4 videos to your mirrored course. This Web 2.0 tool was used to make the tutorials on the model Blackboard Coursesites.

SurveyMonkey: www.surveymonkey.com

➤ Create quick surveys, quizzes for free and send by email.

TeacherTube: www.teachertube.com

➤ Compilation of educational videos that can be embedded in the Blackboard mirrored site.

Twitter: http://twitter.com/
Use in many ways, specifically as a way to have a running conversation with your students on a topic or class discussion. Can be used in the face-to-face setting as well as asynchronous in a blended distance use.

Voki: [www.voki.com](http://www.voki.com)

- Allows students to create speaking Avatars for posting on discussion boards, blogs, wiki’s.

Wikispaces: [www.wikispaces.com](http://www.wikispaces.com)

- Free blogging and webspace application. Can be used in place of the Blackboard coursesite, but only if assignments can be private and secured from the general viewing public.

Youtube: [www.youtube.com](http://www.youtube.com)

- Free video sharing and repository site. Teachers can maintain a private channel of their own video productions using Screencast-O-Matic and embed directly to Blackboard.

Zoho: [www.zoho.com](http://www.zoho.com)

- Allows students to use a free online Wordprocessor other than Microsoft.

**Discipline Specific Tools**

**English/Language Arts:**


- Free citation generator

Dropbox: [www.dropbox.com](http://www.dropbox.com)
TRANSFORMATIONAL CHANGE

► Secure filesharing

EdSitement: http://edsitement.neh.gov/

► Free repository of lesson plans and units by topic or authors.

FreeReading: www.freereading.net

► Opensource free reading intervention for Pk-6. Lessons, online activities, and reading resources.


► Hunger awareness literacy quizzes

Grammarly: http://www.grammarly.com

► Free grammar checker. Use as part of a lesson on grammar and ask students to post their first draft and then revised draft.

Guide to Grammar and Writing: http://grammar.ccc.commnet.edu/grammar/

► Comprehensive repository of grammar guides, tests, powerpoints and online quizzes. Have students complete quizzes and copy results to Blackboard.

IntoTheBook: http://reading.ecb.org/teacher/priorknowledge/index.html

► Comprehensive resource on reading and reading strategies. Elementary level.

LoudLit: http://www.loudlit.org/collection.htm

► Audio books classics.

Owl at Purdue Writing Lab: www/owl.english.purdue.edu/

► Writing advice, textbook style information and citation examples.

Paperrater: http://www.paperrater.com/free_paper_grader#

► Free and instant paper evaluation. Gives grammar, word choice and plagiarism advice.
ProjectGutenberg: http://www.gutenberg.org/
  ▶ Free ebooks, some in audio format.

Read WriteThink: http://www.readwritethink.org
  ▶ Classroom resources, lesson plans and interactives. Includes handouts and powerpoints

Spellingcity: http://www.spellingcity.com
  ▶ Free spelling and word games. Elementary level.

TheFreeLibrary: http://www.thefreelibrary.com/
  ▶ Many free ebooks, especially the classics.

UEN- Grades 4-6: http://www.uen.org/3-6interactives/lang_arts.shtml
  ▶ Free spelling, word games, mad libs and more.

Visual Thesaurus: http://www.visualthesaurus.com/app/view
  ▶ Visual representation of words and their logical connections.

VoiceThread: www.voicethread.com
  ▶ Post documents, visuals and videos for written, audio and voice comments from students. Use as part of group work or cancellation days work.

Wordle: www.wordle.com
  ▶ Visual word clouds. Use to generate ideas, brainstorm and identify themes in text.

WordSmart: http://www.wordsmart.com/wordgames/#
  ▶ Elementary level, free word games and activities.
Math

Elearning for Kids: http://www.e-learningforkids.org/courses.html

➤ Math games elementary level.

Geogebra: www.geogebra.org

➤ Interactive geometry and algebra spreadsheet activities

KhanAcademy: www.khanacademy.org

➤ Largest repository of math instruction videos with interaction.

MIT Mathlets: http://math.mit.edu/mathlets/mathlets/

➤ Math manipulatives for various concepts and visual representations

MetaCalculator: http://www.meta-calculator.com/online/

➤ Free online scientific, graphing, matrix, and statistics calculators.

National Library of Virtual Manipulatives: http://nlvm.usu.edu/

➤ Virtual math manipulatives. Elementary level.

PhET: http://phet.colorado.edu/en/simulations/category/new

➤ Math and Science Simulations. Can be used online or projected in class on Smartboard

Thinkfinity: www.thinkfinity.org

➤ Lesson plan repository for grade levels in Math

WolframAlpha: http://www.wolframalpha.com/

➤ Math, geometry, algebra, physics calculator and repository.
Science

BodySmart: www.getbodysmart.com
  ➢ Interactive anatomy and physiology

  ➢ Chemistry formulas, simulations and interactive quizzes.

Glogster: http://edu.glogster.com/what-is-glogster-edu/
  ➢ Virtual interactive poster creator

  ➢ Interactive Earth, geography, maps.

GoogleSky: http://www.google.com/sky/
  ➢ Interactive astronomy.

Molecular Workbench: http://mw.concord.org/modeler
  ➢ Interactive model simulator

Periodic Table of Videos: http://www.periodicvideos.com/
  ➢ Simulations videos of elements

Nova: http://www.pbs.org/wgbh/nova/hotscience/
  ➢ Readings and interactive activities

Phet: http://phet.colorado.edu/en/simulations/category/new
  ➢ Science, biology, physical model simulations.

Virtual Frog Dissection: http://frog.edschool.virginia.edu/Frog2/
  ➢ Virtual frog dissection
Further Reading and Resources

Adult Technology Skills Assessment:  http://adultedonline.org/index.cfmh

Take the technology skills assessment here or online at the Blackboard Model Coursesite.


International Society for Technology in Education.  https://www.iste.org/

KETEncylomedia. Free professional development for teachers.

http://www.ket.org/encyclomedia/index.php


Web Guru 2.0: Comprehensive Web 2.0 list.

http://web20guru.wikispaces.com/Tools+By+Subject
VITA

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EDUCATION

May, 2005  B.A. English
Shawnee State University
Portsmouth, Ohio

May, 2007  M.A. English
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Morehead, Kentucky

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Morehead State University
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PROFESSIONAL EXPERIENCES

06/2012-Present  Director of Educational Technology
Berea College
Berea, Kentucky

06/2008-Present  Online Instructor of English
Maysville Community and Technical College

06/2010-Present  Contract Consultant Instructional Designer
Kentucky Council on Post-Secondary Education

06/2011-06/2012  Instructor of English/Project Leader-Learn on Demand
Big Sandy Community and Technical College
Prestonsburg, Kentucky

06/2005-06/2009  Graduate Assistant and Adjunct Instructor of English
Morehead State University