



Digital Learning 2020: A Policy Report for Kentucky's Digital Future

December 2011

Prepared in partnership with



“The energy, interest and creative abilities exist in Kentucky to create the national model for digital learning.”

-Commissioner Terry Holliday

“Creating a top-notch system of education is not only a moral obligation, but essential to the development of the human capital that will drive this state.”

-Governor Steven L. Beshear

“Online learning has the potential to be a disruptive force that will transform the factory-like, monolithic structure that has dominated America’s schools into a new model that is student-centric, highly personalized for each learner, and more productive, as it delivers dramatically better results at the same or lower cost.”

-Innosight Institute

“The causes of our lagging education performance are complicated, but in short our schools are obsolete. They cannot accomplish what we need them to accomplish. Mass production style, our schools batch process each age group—some get it, others fail and repeat or drop out. We expect a lot out of teachers during the short school year but give them few tools to accomplish their complicated tasks. But there is a big opportunity right in front of us—to create schools that are digital, engaging, personalized, and work better for everyone.”

-Tom Vander Ark, CEO Open Education Solutions

Table of Contents

Purpose of Report	4
Special Thanks	5
Executive Summary	7
Foreword –Digital Learning Now	8
Introduction	9
The Kentucky Digital Policy Process	11
Digital Learning Summit Focus Groups	12
Growth and Scale of Digital Learning	13
Digital Learning Exemplars	15
Advantages and Challenges to Digital Learning	17
Digital Learning in Kentucky	19
Recommendations	24
Timelines	27
Bibliography	28
About the Authors	31
Appendix A - Glossary	33
Appendix B - Acknowledgments	36
Appendix C - Feedback Form	39

Purpose of Report

The purpose of this report is to advise a working group of members from the Kentucky Department of Education (KDE) as well as key Kentucky education partners with an interest in improving the digital learning environments in Kentucky schools.

Specifically, a focus on moving Kentucky to a single statewide presence that will allow school districts to access and provide online courses and other digital resources for students and teachers shall be an overall investigation of this report.

The deliverables for the report include:

1. A report that provides written recommendations by October 1, 2011.
2. The recommendations should include alternative approaches to take Kentucky from its' present state to a single point of presence for school districts to access and provide online courses and digital resources to their students and teachers.
3. In addition, the recommendations should include potential governance structures, suggested implementation plans, and realistic funding options.

The complete written report constitutes just one way the authors met the expectations of our contract. Surveys, virtual meetings, phone and e-mail contacts between the authors and KDE took place throughout the duration of this contract. A digital summit was also jointly developed on September 7, 2011 by KDE and the authors. Kentucky education leaders and stakeholders met to discuss in depth the drivers, barriers, and opportunities for Digital Learning in Kentucky.

In addition, the report was compared and contrasted with the *Digital Learning Now Report 10 Elements of High Quality Digital Learning* released in December of 2010 as well as Kentucky's state scorecard which will be announced on October 13, 2011 at the National Education Summit in San Francisco, California.

Moreover, our work maps back to the Kentucky Governor's Task Force Report, *Breaking New Ground* as well as a host of digital resources outlined in a later section of this report. As you read the entire report, you will note a comprehensive scan of Kentucky's digital learning environment and resulting recommendations that align with Kentucky's p-20 vision for Unbridled Learning.

Special Thanks

Open Education Solutions would like to offer a special thanks to the following education leaders in Kentucky. The passion, vision, and execution of policy and practice are alive and well in the Commonwealth as a result of the following digital champions:

Governor Steven L. Beshear

Steven L. Beshear was elected governor of the Commonwealth of Kentucky in November 2007. Governor Beshear has a long background in public service, having served as a state representative in the Kentucky General Assembly, attorney general and lieutenant governor prior to being elected governor. To each of these positions he has brought a foundation of integrity and ethics, as well as a deeply felt commitment to improving the lives of fellow Kentuckians. His work on *Breaking New Ground* sets a blueprint for alternative pathways to success for all of Kentucky's students.

Dr. Terry K. Holliday, Commissioner of Education

Terry Holliday was selected as Kentucky's fifth commissioner of education in July 2009. Holliday previously served as superintendent of the more than 20,000-student Iredell-Statesville school district from 2002 until 2009. During his tenure, he has received recognition in a variety of areas including being named 2009 North Carolina Superintendent of the Year. Under his leadership, the Iredell-Statesville school district received the 2008 Malcolm Baldrige National Quality Award. His approach to *Unbridled Learning* in Kentucky is all about knocking down the barriers to reform and transforming the student experience through digital learning.

David Cook, Director of Innovation, Kentucky Department of Education

David's work in policy development in Kentucky showcases an impressive background in project management, research, policy development and communication in the public sector and with public policy advocacy groups. We are indebted to David and his shop for vesting so many people in the work of this report. Thank you David for giving Kentucky a broad voice in this report.

Bob Fortney, Senior Consultant, Kentucky Department of Education

Bob Fortney is one of the original four members of the Kentucky Virtual High School (KVHS) team. He joined the KVHS project in December 1999. He is currently responsible for online professional development, training, and virtual professional learning communities. His work on this report has been the fuel to David Cook's charge of enlisting multiple stakeholders in the effort. A true hero for making this work come together, and a partner in the success of all children in Kentucky, we could not have written this report without Bob's support.

Nancy Carpenter, Sr. Director of Education, Kentucky Educational Television Under her leadership, KET's education division received a national Enterprise and Innovation Award for its exemplary success in delivering education services to generations of students, teachers, parents and care providers throughout the state of Kentucky. Nancy's work was invaluable in this effort to provide a forum for our Digital Summit and to partner with KDE in this effort. We appreciate her leadership, energy, resources, and collaboration in this work.

Lynda Thomas, Manager of Distance Learning and Professional Development at Kentucky Educational Television

Lynda works with the Kentucky e-Learning for Educators project to produce video-rich, online professional development. Lynda's work on setting up and providing support for the Kentucky Digital Learning Summit on September 7, 2011 was no small feat, and we appreciate all she did to make the event smooth and seamless.

Executive Summary

Kentucky has embraced a clear and compelling goal – college and career readiness for all. First to adopt the Common Core State Standards, Kentucky is working with urgency to double the percentage of graduates that leave school college and career ready by 2015.

The Commissioner and State Board have advanced a vision of Unbridled Learning with legislative support provided by Senate Bill 1 which outlines learning goals, assessments, and an accountability system that promotes the success of next generation students, professionals, support systems, schools, and districts.

Building on this foundation, [Breaking New Ground](#): The Final Report of the Governor’s Task Force on Transforming Education in Kentucky, outlines an education system with equity of access; personalized uses of technology in all classrooms; in professional learning communities; performance-based anytime, anywhere learning; and the use of technology to meet special needs. The report envisions new high school models featuring advanced coursework, expanded access to world languages, and assessment of 21st century skills.

This report specifically addresses one recommendation of the Governor’s task force to make better use of technology to improve teaching and learning and “Implement policies to enhance and expand virtual and blended learning, including funding options to ensure equitable access to students across the Commonwealth.” A two-month planning process involving surveys, interviews, and focus groups resulted in 11 recommendations in five categories.

Kentucky should leverage the planned shift to online assessment over the next three years by implementing several blended learning pilot programs, working with districts to improve student access, and supporting the transition to digital instructional materials.

To provide every student in the Commonwealth with quality educational options, it is recommended that the state contract with multiple statewide online learning providers for full and part time enrollments supported by fractional funding that follows the student. This would require open enrollment or virtual charter legislation and a phase out of line item budgets for existing providers. Short of legislation expanding student options, districts should be encouraged to expand online and blended options with the support of statewide vendor agreements.

The shift to personal digital learning requires coordination and state level investment in technology, training, and support. Support of regional and national foundations as well as vendor partners can help support the transition.

Kentucky has a strong stable of talent poised for the race towards a digital future. The recommendations presented in this report will assist more Kentucky graduates to leave high school ready for college and careers. The integration of these recommendations across The entire p-20 education landscape is the key to winning that race.

Forward – Digital Learning Now

We share a vision for education in America.

Our vision is an education that maximizes every child’s potential for learning, prepares every child with the knowledge and skills to succeed in college and careers, and launches every child into the world with the ability to pursue his or her dreams.

By unleashing the power of digital learning, America has the ability to realize that vision today.

Digital learning can customize and personalize education so all students learn in their own style at their own pace, which maximizes their chance for success in school and beyond. With digital learning, every student - rural communities to inner cities - can access high quality and rigorous courses in every subject, including foreign languages, math and science.

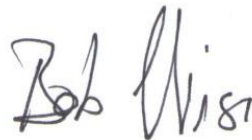
Digital learning can also be the catalyst for transformational change in education. It is a tool that can address a myriad of challenges faced by schools, community leaders, and policymakers. Digital learning can connect students in the most remote areas with high quality college - and career-prep courses taught by a highly qualified teacher who does not work inside their school building. It can be a powerful tool for teachers who are struggling to meet a variety of student needs. And it can connect communities to a vast network of resources that will help their students compete and succeed in the global economy.

As Governors, we learned that a comprehensive roadmap to reform yields success. That’s why we convened the Digital Learning Council with leaders in education, government, philanthropy, business, technology and think tanks to define the actions that lawmakers and policymakers must take to spark a revolution in digital learning. More than 100 people from across the nation invested countless hours and energy in this rapid virtual policy development. We are grateful to the council members for forging a path for education’s historic shift from print to digital, from age groups to individuals and from seat time to competency.

The Elements of High Quality Digital Learning is just the beginning. During the next year, we will work to turn proposals into policy and arguments into action to transform education for today’s students. We hope you join us.



Jeb Bush



Bob Wise

Introduction

Kentucky's history includes early leadership in the field of virtual learning. Yet, over a decade later, Kentucky is at a tipping point regarding where it will go next in the field of digital learning.

This report offers a diligent scan of Kentucky's p-20 educational landscape to ascertain appropriate methods for funding, support, and innovation through digital learning. Moreover, it takes into account the *Kentucky Governor's Task Force Report* and the Kentucky Department of Education's work in providing innovative pathways to graduation.

This report is also informed by the Digital Learning Now (DLN) report that was a collaborative project of former Florida Governor Jeb Bush and former West Virginia Governor Bob Wise.

In addition, the DLN released the [Nation's Digital Learning Report Card](#) this fall, which highlights all states, including Kentucky's progress aligned with the DLN 10 Elements for High Quality Digital Learning. This report will be useful when bench marked against the [Kentucky state report card](#).

The authors of this report believe as the architects of DLN do, that the current challenges of the economy, teacher shortages, and the paradox of global skills vs. academic attainment creates a crisis in American Education.

Where does Kentucky stand in addressing this crisis?

Kentucky has made recent bold strides in Digital Learning including the launch of Kentucky's *iTunes U site*. This free learning resource provides access to numerous teacher- and student-friendly sites that provide unlimited opportunities for digital learning. In addition, the 1:1 iPad solution in Woodford County is an excellent example of progress in terms of digital learning and planning.

Kentucky's partners at the UK P20 Innovation Lab and the Center for the Advanced Study of Technology Leadership in Education (*CASTLE*) are stretching Kentucky's thinking on a digital future, and 16 school districts are partnering with Kentucky through the Council of Chief State School Officers (*CCSSO*) to design the next generation of schools and learning opportunities.

Yet, according to a recent study by the 2011 Blue Grass Institute in Kentucky, "significant policy roadblocks still need to be removed for all of the state's education practice to be transformed by digital learning".

Therefore, we have compiled all of the components of Kentucky's wave of digital reform to highlight the many perspectives of stakeholders in this report focused on informing recommendations that operationalize the 10 DLN elements.

As a guidepost through the report, we hope policy makers will use the DLN elements as the

foundation of educational policy reform in Kentucky. They are as follows:



DIGITAL LEARNING NOW!

1. **Student Access:**

All students are digital learners

2. **Barriers to Access:**

All students have access to high quality digital content and online courses

3. **Personalized Learning:**

All students can use digital learning to customize their education

4. **Advancement:**

Students progress based on demonstrated competency

5. **Quality Content:**

Digital content and courses are high quality

6. **Quality Instruction:**

Digital instruction is high quality

7. **Quality Choices:**

All students have access to multiple high quality providers

8. **Assessment and Accountability:**

Student learning is the metric for evaluating the quality of content and instruction

9. **Funding:**

Funding creates incentives for performance, options and innovation

10. **Infrastructure:**

Infrastructure supports digital learning

Kentucky Digital Policy Report Process

A request for proposal by the Kentucky Department of Education was awarded to Open Education Solutions on July 1, 2011. Upon receiving the award, Open Education Solutions launched into a three phase report approach regarding Kentucky's digital landscape.

Phase 1: Quantitative Data Analysis

Our policy review process included working with the Department of Education's steering team to determine 25 seminal documents in Kentucky's Digital Learning history. Sample reports from this effort including the Governor's Task Force Recommendations, Blue Grass Institute Reports, SEDTA, Keeping Pace, and The KDE Technology Readiness Survey.

All of these reports were reviewed and collaborated on by our design team inside of Kentucky's e-learning community in the Blackboard Learning Management System during the month of July. The findings of our review are included in a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis section of this report.

Phase I also included surveys that were sent to the 117 stakeholders in this report. At the time of the final collection horizon, 56 participants had completed the Likert scale agreement survey and, 46 respondents provided comments on the report.

Phase II: Qualitative Methods

We selected 35 members of our stakeholder group featured in the acknowledgements section of this report to be scored on a five question ADKAR model as to change management readiness. These phone interview responses yielded significant data in terms of informing this report.

In addition, to the phone interviews, we conducted a Digital Learning Summit wherein we held focus group interviews based on Stanford University's work regarding organizational management and force field analysis. The drivers, barriers, and solutions from this work helped to augment the survey data, qualitative phone interviews, and artifacts we were able to review and analyze for the overall report.

Phase III: Report Feedback Loops

A follow-up survey to the summit and an open recommendations form were shared among all stakeholders as well as with the KDE Steering Team. After the Open Education Solutions team compiled all comments on our initial survey document as well as the feedback from our follow-up surveys and open comment period, we worked with staff at the KDE to check for inaccuracies or incomplete resources. The result of our iterative feedback process from September 8, 2011 to October 1, 2011 strengthened the overall quality of this report

Digital Learning Summit Focus Groups

Focus groups consisting of teachers, superintendents, technology specialists, state leadership, higher education, digital learning advocates, pioneers, and private sector representatives were convened on September 7, 2011 at the Kentucky Education Television Center to garner feedback prior to finalizing the report.

Nancy Carpenter, Senior Director of Education for Kentucky Education television generously hosted a Digital Learning Summit from 9:00a.m. to 12:00p.m. where the focus groups were conducted. Special thanks go to Nancy's team member Lynda Thomas, Manager for Distance Learning, for arranging logistics for the event.

The process for organizing the focus groups included a random sort of all summit participants into three groups. The groups were sorted by digital learning elements from the *Digital Learning Now Report*. Group A was facilitated by Open Education Consultant, Don Hall. Don's group conducted a force field analysis of drivers, barriers, and possible solutions for Digital Learning Now Elements 1-3: Eligibility, Access, and Personalization. Results from focus group A were cross-walked with this report's final recommendations.

Tom Vander Ark, CEO of Open Education Solutions, facilitated the same process for Focus Group B which addressed elements 4-6: Advancement, Content, and Instruction.

Bryan Setser, Chief Innovation Officer for Open Education Solutions, concluded the focus group work with his group which addressed elements 7-10: Providers, Assessment and Accountability, Funding, and Delivery.

As expected, the group provided a sharp critique of the report making numerous suggestions that helped clarify and focus the final product. All participants felt it would be beneficial to bring a group of educators and digital pioneers together to evaluate the report recommendations, share success stories, frustrations, and action steps to be addressed to fully integrate and embed this technology into high quality teaching and learning in Kentucky's schools.

They also unanimously reinforced the need to use, integrate, and create digital methods to communicate and share with their peers across Kentucky, the United States as well as globally. While the conclusions and recommendations in the report are the author's, the report was sharpened by the focus group's feedback; and their input was greatly appreciated.

Growth and Scale of Digital Learning

The shift to digital learning is expanding educational opportunity in the U.S. and even more significantly in emerging economies. The potential to customize learning, to boost engagement, and to extend learning at reduced costs is a set of world-changing opportunities.

The shift is being propelled by expanding broadband, inexpensive access devices, cloud computing, and improving content. Five trends are propelling the shift in U.S. K-12 sector:

Five Shift Propelling Trends

1. *Higher expectations of real college and career-ready standards reflected in the Common Core.*
2. *Most states will help orchestrate improved student Internet access to support a shift to online assessment by 2014.*
3. *An extended “new normal” period of flat or shrinking resources in most states.*
4. *Expanding mobile access and student demand for learning options—both formal and informal.*
5. *Growing full and part time enrollment in online learning especially in states that support multiple providers.*

A recent [Ambient Insight](#) report suggests that online learning is growing even faster than expected. The report says, “Over 4 million students are currently participating in some kind of formal virtual learning program”, and “The combined online population is currently growing by 46% a year and the growth rate is accelerating”.

Ambient suggests that, “A conservative forecast is that by 2015, over 4.5 million US children will be schooled at home.” That would be 8.2%, of all school children and with virtual charter enrollments, Ambient forecasts that more than 10% of students will be learning at home by 2015. It is possible that as many as 9 million students, or close to 15% of the K-12 population, could be learning predominantly at home by 2020.

Students blending their own learning through supplemental enrollment will continue to grow by almost 30% as more states expand access, and may hit 15 million students by 2020.

In the next year most charter networks will incorporate online learning allowing some of them to accelerate their growth rates. Charter enrollments will more than double to 4 million students before the end of the decade.

While learning at home may triple by the end of the decade, most of the growth in digital learning will be adopted by existing schools. By the end of the decade most K-12 schools will blend online and onsite learning. But unlike the last 20 years, it won’t be adding computers to the way we’ve always operated school.

Blended learning is a shift in instruction to an online environment for a portion of the student day designed to improve learning and operating productivity. Michael Horn, author of [The Rise of Blended Learning](#), adds “some element of student control over time, place, path, and/or pace.” Horn and co-author Heather Staker outline six variations of blended

learning and a couple of early examples in each category.

The adoption of blended learning by public schools will be a function of early examples of success, ease and affordability of conversion, and the extent to which there is continued cost and achievement pressure.

Exemplary Programs & Schools

Blended Elementary

[Rocketship Education](#): students at the California elementary school network spend two hours per day in a learning lab to personalize instruction and stretch the learning day and year. Rocketship schools are among the top performing schools in the state despite high levels of poverty and a high percentage of English Language Learners.

[KIPP Empower](#): a Los Angeles elementary school, has 15 computers in each classroom. Instruction takes place in small groups with students rotating on and off computers throughout the day. Teachers utilize adaptive software that directly assesses students' learning needs and allows students to progress through the material at their own pace. Those students who are not on the computer receive small-group and individualized instruction from their teachers in the core subject areas of reading, writing, math, and science.

Blended Secondary

[Carpe Diem](#): Class periods at Carpe Diem Collegiate High School are 55-minutes long. For each course, students spend one period in an online-learning room for concept introduction and one period in a workshop for application and reinforcement. They complete two to three rotations per day. While students can accelerate their progress, most students progress as a cohort.

[San Francisco Flex](#): Powered by K12's digital curriculum, Flex combines the structure and support of a physical school with individualized education plan.

[AdvancePath](#): the network of 24 dropout-recovery academies features a computer lab, where students spend most of their time learning online. But face-to-face, certified teachers also call the students into an offline reading and writing zone or small-group instruction area for flexible, as-needed help. (Disclosure: Tom is a board member.)

[Kunskapsskolan](#): a Swedish network of individualized schools that feature weekly goal setting and personalized support. Their first school in the United States opened this month, Innovate Manhattan Charter School.

Partial Blends

Online labs: Faced with a teacher shortage, Miami-Dade County Public Schools turned to [Florida Virtual School](#)'s virtual learning labs for help. Students complete courses online at their traditional school under adult supervision, but with no face-to-face instruction.

[North Carolina Virtual's](#) Occupational Course of Study Program: Face to face exceptional children's teachers partner with virtual teachers of record to ensure all teachers are highly qualified and that students receive co-teaching access and blended resources.

[Jefferson County eSchool](#): served 27,000 students last year including many part time enrollments by Kentucky secondary students for acceleration or credit recovery where districts allow this form of self-blending.

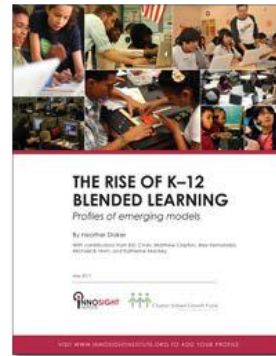
Blended Math

[School of One](#) is a New York City middle grade math pilot program that is the best early example of multi-modal customized learning. Daily assessments and performance feedback drive a recommendation algorithm that chooses the next best learning experience for each student.

[ST Math](#), from MIND Research Institute, is a visual and game-based approach to learning math that complements a traditional core curriculum with two 45-minute computer-based sessions weekly. Randomized controlled trials from over 1000 schools nationally indicate dramatic gap closing results.

[Carnegie Learning](#) Blended Math Curricula is a combination of collaborative, student-centered textbook lessons and adaptive Cognitive Tutor software lessons. Research indicates improved results in Algebra, subsequent courses and SAT scores.

See [The Rise of Blended Learning](#) (Innosight Institute, 2011) for additional examples and background.



Advantages and Challenges to Digital Learning

When organizations choose to make the shift from traditional models of operations to one where technology plays a pivotal role, the cost-benefit ratio must be considered. Significant organizational capital, energy and focus are spent performing this type of transformation. As a result, it is critical to understand the advantages and challenges associated with the changes.

Advantages of Digital Education

Access and Options

- Assists local districts in complying with *No Child Left Behind (NCLB)* provisions for a “highly qualified teacher” in every classroom;
- Expands options for advanced placement courses;
- Expands access to multiple foreign language courses;
- Expands options for credit recovery during the school year and summer period;
- Offers expanded options to meet supplemental services (tutoring) requirements under *No Child Left Behind* as well as offerings for gifted and talented students;
- Helps prepare students for the future where computers permeate virtually every facet of life;
- Allows for more frequent assessment of student’s progress;

Personalized Learning

- Changes learning from a passive to an interactive experience where students learn by doing;
- Develops online communities and networks where learners may transcend racial, political, socio-economic, race and ethnic boundaries to share ideas and knowledge freely;
- Empowers learners to manage their own learning and to seek the best ways to absorb new knowledge;
- Helps break down the idea that schools offer a “one size fits all” educational program;
- Provides ability to create flexible education programs for homebound, expelled, suspended or incarcerated students at risk of dropping out;
- Ability to individualize learning so students can learn at their own pace;
- Provide for continuous academic feedback to students and parents;
- Helps accommodate the different learning styles of students by allowing material to be presented in multiple ways;
- Taps into the students’ natural connection to technology;
- Develops a foundation for future success because it fosters discipline and assuming responsibility for learning;

Policy and Support

- Improves technology skills demanded by the 21st century economy;
- Has potential to enhance the quality of professional development for staff at lower cost.

Challenges for Digital Education

Access and Options

- Often a huge time gap between professional development and training and when technology is available in the classroom;
- Insufficient instructional planning time;
- Technology is not accessible – a teacher pointed out that no one expects to take students to the “pencil center.” Why then is it acceptable to have to wait until time is scheduled in the media center or computer lab to use technology?
- Children in poor communities often don’t even have a phone at home let alone Internet access;
- Technology within many schools is antiquated;
- Fear of loss of jobs.

Instructional Barriers

- Fear of change;
- No immediate, compelling reason to change;
- Availability of quality instruction content is often costly and requires more planning than a traditional textbook
- Technology often does not work as well as promised – another teacher said, “there’s too much pressure from *No Child Left Behind* – we don’t have time to wait for technology to work”.

Policy and Support

- Lack of quality on-going professional development for teachers;
- Lack of technical support in the school building – a teacher cited that they are expected to fix antiquated technology and teach kids at the same time;
- Existing legislative and regulatory policies and procedures reinforce the traditional education model and often prohibit change
- Educators are expected to deliver 21st century education skills with a 20th century budget;
- Funding technology while eliminating programs and staff is politically challenging for a superintendent who proposes it and a school board that supports it;

Digital Learning in Kentucky: SWOT Analysis

Education pundits have long promised that technology would transform today's outmoded schools, most of which were designed to prepare young people for the industrial age rather than a knowledge economy. To date the majority of classrooms have not benefited from the promise and potential of technology. Leading commentators frequently point out that Education remains one of the few sectors that information and communications technologies have not transformed.

In review of documents, surveys and interviews, the following observations are noted with regard to Kentucky and its relative transformation using Digital Education.

Strengths

Access

- Kentucky's students per high-speed, Internet connected computers matches the country's average. (Alliance of Excellent Education (AEE), 2010)
- The state's percentage of eighth-grade students with access to computers in their classroom is nearly double the national average. (AEE, 2010)
- Close to 70% of the parents believe on-line textbooks are a good investment. That number was just 21% in 2008. (Couch, 2011)
- 30% of students have experienced blended learning. Just two years earlier that was only 10%. (Couch, 2011)
- For those schools with ease of access to a mobile device, daily use technology in core classes ranges from 51% to 63%. The subject areas that are most likely to use digital content when students have ease of access are: Science (62% daily use, 31% weekly use), Social Studies (62% daily, 28% weekly), English/Language Arts (60% daily, 35% weekly), Reading (57% daily, 38% weekly), Math (57% daily, 34% weekly). (Couch, 2011)
- Strong mature and pilot programs already exist in the state to highlight the advantages of digital learning in a variety of forms. (I.e. Barren Co., Carter Co., Hancock Co., Jefferson Co., and Woodford Co.)

Online learning

- The presence of multiple online learning providers and resources including KVHS, state universities distance learning program, KET distance learning, KY Virtual Library and the Adult Education Learning for Life program.
- Kentucky Virtual Schools (KYVS) had roughly 2,300 enrolled students and offered eighty-six unique courses, twenty-three of which were Advanced Placement (AEE, 2010).

Professional Development and Support

- Kentucky is one of nine states participating in e-Learning for Educators Initiative, a federally funded program seeking to establish an effective and sustainable model of online professional development.
- The state focus for their EETT funds were devoted 50% to equipment and professional development and 50% to projects to increase teacher effectiveness.
- The state funds an e-Learning Kentucky (ELK) program that provides online professional development services to adults. (SETDA, 2011)

- A group of 16 school districts is partnering with KDE through the *Stupski Foundation* and Council of Chief State School Officers (CCSSO) to design the next generation of schools and learning opportunities. (Holliday, 2011)
- KDE's partners at the UK P20 Innovation Lab and the Center for the Advanced Study of Technology Leadership in Education (CASTLE) are stretching the state's thinking for the future. (Holliday, 2011)
- Teacher networks across the state are creating curricula to implement the new standards. (Governor's Task Force, 2011)

Policy

- The state standards for students include a technology literacy component.
- Teacher and principal licensure requirement includes a technology component.
- The 2007 - 2012 Education Technology Master Plan describes how technology will be used to improve teaching and learning for all of Kentucky's children.
- Public advocacy exists to support Kentucky's move toward digital education as seen in entities like the Bluegrass Institute for Public Policy Solutions report.
- The presence of a publicly supportive and forward thinking Commissioner of Education is a great asset in making the digital shift.
- Kentucky has a history of innovative education initiatives – from the Kentucky Education Reform Act (KERA) of 1990 to Senate Bill 1 of 2009. (Governor's Task Force, 2011)
- The Commissioner's Parents Advisory Council (CPAC) was created to advise KDE on policy issues and to increase positive leadership of parents for improving public education. (Governor's Task Force, 2011)

Weaknesses

Access

- The percentage of individuals with access to Internet at home is well below the national average. (AEE, 2010)
- The cost to participate in online learning activities can be prohibitive for lower socio-economic families
- Not all geographic areas of the state have equitable access to a high-speed broadband infrastructure and services.
- Close to 70% of parents said they would be willing to buy their child a mobile device to use at school but close to 70% of the principals don't want personally owned student devices coming in their school. (Project Tomorrow, 2011)
- Overly stringent filtering policies in many school districts limit teachers and students' access to online instructional resources. (Holliday, 2011)

Online learning

- The state currently provides one funded primary distance learning option to its schools – Kentucky Virtual School.
- Additional public education is needed to allow all stakeholders to effectively access and use the distance learning options available in the state.

Professional Development and Support

- A sustainable, well-funded professional development program is still needed to prepare teachers and educational leaders to make this shift from the traditional education model.
- The Kentucky Department of Education's recently conducted Teaching, Empowering, Leading and Learning (TELL) survey of teachers shows a majority of Kentucky's teachers (62.1 percent) say they need more professional development in integrating technology into their instructional delivery. (Kentucky Board of Education Presentation, 2010)
- Over 75,000 students in Kentucky are in some form of alternative education; however, the state's data system to track the progress of these students is in great need of improvement. (Holiday, 2011)
- District technology coordinators inform us that there is no state-sponsored authority similar to the Kentucky State Textbook Commission to review and provide recommendations about the quality of digital learning programs. There also is no non-governmental organization with any significant program to collect and distribute reviews of digital learning courses. (Innes, 2011)

Policy

- Although the standards exist, students are not universally tested for technology literacy. (AEE, 2010)
- Existing state policies and regulations regarding compulsory student attendance, graduation requirements, and facilities.
- Funding for the state master technology plan does not meet the full spectrum of needs in the state's schools and it is well below comparable private sector norms.
- Kentucky's current legislation on inter--district transfers does not allow any student who is under-performing in his current district or is in danger of dropping out to transfer to online learning programs and all non-local education dollars follow the students to that district's online learning program. (Innes, 2011)
- The SBDM school governance model can create extremely serious roadblocks for the effective and efficient implementation of any educational improvement in schools where the school culture is generally hostile to changes, digital learning most definitely included. (Innes, 2011)

Opportunities

- Creating coalition partnerships among the various distance-learning providers to share resources to reduce duplication of effort, address the K-20 stakeholder needs more effectively, and create economies of scale for more complete programs at lower costs.
- A task force was appointed by Governor Steven L. Beshear in October 2009 and worked over a period of 15 months studying Kentucky's education system in order to provide recommendations to the Governor for transforming the state's education system to meet the needs of 21st-century students.



- The ability to leverage public support for digital education can be effective in getting the necessary changes in key state laws and policies.
- The #1, #2 and #3 education technology trends in K-12 are mobile computing, blended learning and electronic text books/materials. These address the top complaint of secondary students in KY (i.e., lack of ease of access to technology tools and resources for learning) (Couch, 2011)
- 71% of the high school students and 62% of the middle school students said the #1 way schools could make better use of technology would be for the district to allow greater access to appropriate electronic digital content and resources that the district content filters now intentionally or accidentally block. (Couch, 2011)
- Studies show that when a 1:1 is properly implemented (this includes either already having or moving to best teaching practices) 92% of the schools experience a reduction in disciplinary action, 90% experience an increase in high stakes test scores, 89% experience a reduction in their dropout rate and 63% experience an increase in graduation rates. A blended learning environment also yielded similar high results. (Couch, 2011)
- Daily use of technology for instruction and assessment delivers the best return on investment. From a CIITS perspective, the schools that have ease of access to a mobile device for their students will be best positioned to take full advantage of getting immediate feedback (i.e., daily) through the on-line formative test module in CIITS (aka ASSESS) that use the questions teachers select from the Pearson/KDE item bank that are aligned to the Common Core standards. (Couch, 2011)
- Implementing recommendations in Breaking New Ground: the Final Report of Governors Task Force on Transforming Education in Kentucky is a powerful opportunity to bring about significant change.
- School districts should explore and implement effective models to personalize learning for all Kentucky students.
- The Kentucky Board of Education (KBE) should develop a long-term strategy for enhancing the teaching of world languages at all grade levels.
- The Secretary of the Education and Workforce Development Cabinet and the Commissioner of Education should establish a steering committee to develop a comprehensive statewide plan to implement a new model of secondary career and technical education with an emphasis on innovation and integration of core academics, 21st-century skills, project-based learning and the establishment of full-time career and technical education (CTE) programs, for implementation in the 2012 General Assembly. The plan should include a new delivery system that integrates and elevates the two offices in KDE and OCTE currently delivering CTE.
- The KBE should develop flexible policies by the 2011-12 school year that encourage innovation and allow students to meet course requirements through personalized, performance-based, anywhere/anytime learning.
- The KBE should develop and implement policy to enhance and expand the opportunities for virtual and blended learning, including dual-credit policies and funding options to ensure a robust online learning environment for Kentucky and adequate per-pupil funding for online courses that provides equity of access to students across the Commonwealth.
- KDE, EPSB, local districts, colleges of education and institutions of higher education should increase the use of technology in all classrooms and incorporate the use of technology in professional development and teacher preparation to ensure the effective use of technology to improve teacher and student learning at all levels.

- Schools should use adaptive technology and universal design to improve learning for all students, including those with special needs.
- The KBE should develop/adopt state standards for quality of online and blended courses by the end of the 2011-12 school year for implementation in the 2012-13 school year.
- School districts should use a balance of technology-enhanced, formative and summative assessments that measure student mastery of 21st-century skills, including: critical thinking and problem solving, communication, collaboration, creativity and innovation.

Threats

- Projected state deficits indicate a pending funding cliff. Long-term forecasts predict that education funding will not return to former patterns forcing policymakers and educators to use scarce resources more effectively and efficiently to improve student outcomes
- According to the Organisation for Economic Co-operation and Development (OECD), only 40 percent of Americans aged twenty-five to thirty-four have a two- or four-year college degree, ranking the United States tenth among industrialized nations. The state's high school and college graduation rates mirror the country's. (AEE, 2010)
- Funding for the one state supported virtual school (KVHS) has been reduced for the 2011-2012 budget year, which could negatively impact the delivery of services to students and staff. (Fortney, 2011)
- Public perception by some stakeholders that no substantive changes are needed in the current education model.
- Over half of the middle school and high school students that did not have a 1:1 opportunity in their schools said the very top obstacle was the school not allowing them to use their personally owned Smart Phones since the school was not already providing them ease of access. (Couch, 2011)
- Kentucky ranks 33rd in terms of the proportion of its 2018 jobs that will require a bachelor's degree and is 16th in jobs for high school dropouts. By 2018, 54 percent of all jobs in Kentucky (1.1 million jobs) will require postsecondary training beyond high school. This is 9 percentage points below the national average of 63 percent. Kentucky ranks 48th in postsecondary education degree projections for 2018.14. (Governor's Task Force, 2011)
- The latest graduation rates from the National Center for Education Statistics' 2010 Digest of Education Statistics indicate that in the 2007-08 school term, only 74.4 percent of Kentucky's students graduated from high school on time. This was three-tenths of a point below the nationwide average and is part of a recent decay in graduation rates for the state. (Innes, 2011)

The latest available data shows more than one out of three recent Kentucky high school graduates who entered the state's postsecondary education system was required to take at least one non-credit bearing college remedial course upon matriculation. (Innes, 2011)

Recommendations

Closely aligned with [Breaking New Ground](#): The Final Report of the Governor’s Task Force on Transforming Education in Kentucky (BNG) and considering the 10 Elements of the [Digital Learning Now](#) report (DLN), the following recommendations build on the interviews, summit discussions, and the SWOT analysis.

Access to Digital Learning (DLN 1-2; BNG 3-8).

1. All students should be eligible for digital learning. Eligibility for full and part time learning options is key to a number of BNG recommendations including advanced courses, world languages, and special needs, credit recovery, and dual credit.

- 1.A. Expand access to advanced coursework: offer all AP, dual enrollment, world language, and STEM courses (BNG 4A).
- 1.B. Offer four district pilots of expanded upper division and dual enrollment offerings with rolling enrollment and no enrollment caps.
- 1.C. Involve Council of Post Secondary Education (CPE) to look at expanding dual credit high school courses into more digital dual credit HS courses.

2. Authorize multiple statewide online learning providers to expand full and part time options. Like recommendation #1, a multiple providers environment fulfills the BNG vision.

- 2.A. Require high school students to take at least one course online.
- 2.B. Issue an RFQ/RFP for upper division high school courses.
- 2.C. Issue RFQ/RFP for competency-based, credit recovery, and drop out prevention courses and programs.
- 2.D. Expand the Department’s internal capacity to evaluate and authorize multiple providers and to negotiate pricing for part time enrollment and services

The first two recommendations require legislative expansion of educational options either through open enrollment (e.g., Washington State) or virtual charter schools. Short of legislative expansion, districts should be encouraged to expand online and blended offerings with the support of approved vendors and negotiated pricing.

Personalization and Advancement (DLN 3-4, BNG 3, 6D)

3. Allow students to personalize their learning.

- 3.A. Expand access to supplemental digital learning resources with a focus on free and open content.
- 3.B. Expand access to part time online enrollment.

4. Support customized learning pilots

4.A. Provide technical and convening support to the districts working with CCSSO.

4.B. Support development of Jefferson eSchool and Barren Bavel Academy lab sites.

5. Support competency-based learning pilots

5.A. Sponsor 3-5 lab schools models of competency-based instruction.

5.B. Sponsor adoption of dropout prevention and credit recovery centers in at least four cities.

5.C. Sponsor at least two district conversions to digital and competency-based learning with intensive support and professional development.

5.D. Involve the UK and other Innovation Centers to help with gaming and other emerging digital options.

Sponsored projects may require state resources but could be co-sponsored by regional and/or national foundations. In some cases, like dropout prevention academies, districts or the Commonwealth need only issue a request and in many cases vendors will cover upfront investment.

Curriculum and Instruction (DLN 5-6, BNG 6-7)

6. Plan for shift to online instructional materials by 2013-14

6.A. Create a Student Access Taskforce to create a phased plan and create policies for bring-your-own-device environments.

6. B. Expand number of tablet district pilots and collect data from existing implementations in at least a dozen middle and high schools with support from the Innovation Centers.

7. Support the shift to blended instruction

7.A. Create a partnership with an online professional development service provider (a potential new role for Kentucky Virtual).

7.B. Define and implement alternative certification pilots including reciprocity and collect data.

7.C Encourage post-secondary institutions with teacher preparation programs to offer targeted digital instruction training.

7.D. State ensures that teachers have professional development or training to better utilize technology and before teaching an online or blended learning course.

Assessment and Accountability (DLN 8, BNG 8)

8. Plan for online assessment by 2013-14

8.A. Use the Student Access Task Force (see recommendation #6) to plan for student access.

8.B. Make preliminary decision about testing conditions for online assessment (i.e., screen size, timing, security) no later than June 2012.

8.C. Link phases of online learning to phased improvement of student access and shift to digital instructional materials.

9. Create a statewide online/blended learning authorizer/contractor (see #2).

The Department could authorize statewide providers or (in the absence of choice expanding legislation) could negotiate vendor agreements for statewide services with districts (e.g. Jefferson County eSchool) and national providers.

Funding and Infrastructure (DLN 9-10)

10. Develop a fractional and performance-based funding model

10.A. Set course funding level and payment mechanism.

10.B. Link final 5-10% funding (for all secondary courses) to completion and performance.

10.C. Review and update NCLB, Title budgets, broadband, and e-rate to include reallocation of resources for infrastructure and devices.

Course level funding of \$800-900 should adequately support part time enrollment and be covered by state funding. Florida and Utah withhold half of the funding for online courses but that may reduce the number of providers. The state could make 5-10% of funding for *all* secondary courses based on successful completion.

11. Create a program management office and fund the transition

11.A. Support the Office of District 180 mandate to guide and coordinate the shift to personal digital learning.

11.B Develop a communication and support plan.

11.C Invest in three phases of work (outlined below).

Timelines

2011-12

1. Create a program management office
2. Create a statewide online authorizer/contractor
3. Authorize multiple statewide providers starting with an RFP for upper division courses
4. Support 4 district pilots of expanded upper division and dual enrollment courses provided online with rolling enrollment (#1)
5. Support 16 Stupski-supported pilots of customized/competency-based learning (#4).
6. Support 4 district pilots of dropout prevention/recovery academies (#5).
7. Draft student access and BYOD plan (#6).

2012-13

1. Implement phase one of student access plan.
2. Implement phase one of online assessment.
3. Expand access to dropout recovery programs.

2013-14

1. Complete access plans.
2. Support statewide digital instructional materials acquisition/use.
3. Fully implement online assessment.

Bibliography

- Ambient Insight (2011) 2011 *Learning Technology Research Taxonomy*. Retrieved from: http://www.ambientinsight.com/Resources/Documents/AmbientInsight_Learning_Technology_Taxonomy.pdf
- Alliance for Excellent Education. (2009). *Online Learning Addressing Challenge and Seizing Opportunities - Kentucky*. Retrieved from: http://www.all4ed.org/publication_material/DataTechRch
- Bailey, A., Henry, T., McBride, L., & Puckett, J. Boston Consulting Group. (2011). *Unleashing the Potential of Technology in Education*. Retrieved from: <http://www.bcg.com/documents/file82603.pdf>
- David, Couch, (2011, September 20), Email communication
- Experience the Digital Education Revolution website, *Glossary*, (2011, September) Retrieved from: <http://www.deewr.gov.au/Schooling/DigitalEducationRevolution/Resources/guide/AbouttheGuide/Pages/Glossary.aspx>
- Fortney, B. (2011). [Kentucky Virtual Schools Budget 11-12 memo]. Unpublished raw data.
- Foundation for Excellence in Education. (2010). *Digital Learning Now*. Retrieved from: <http://www.excelined.org/Docs/Digital%20Learning%20Now%20Report%20FINAL.pdf>
- Gemin, B. & Watson, J., North American Council for Online Learning (NACOL). (2008) *Promising Practices in Online Learning; Using Online Learning for At-Risk Students and Credit Recovery*. Retrieved from NACOL website: http://www.inacol.org/research/promisingpractices/NACOL_CreditRecovery_PromisingPractices.pdf
- Gemin, B. & Watson, J., North American Council for Online Learning (NACOL). (2009) *Promising Practices in Online Learning; Management and Operations of Online Programs*. Retrieved from NACOL website: http://www.inacol.org/research/promisingpractices/iNACOL_PP_MgmntOp_042309.pdf
- Gemin, B. & Watson, J., North American Council for Online Learning (NACOL). (2008) *Promising Practices in Online Learning; Socialization in Online Programs*. Retrieved from NACOL website: http://www.inacol.org/research/promisingpractices/NACOL_PP_Socialization.pdf
- Gemin, B. & Watson, J., North American Council for Online Learning (NACOL). (2009) *Promising Practices in Online Learning; Funding and Policy Frameworks for Online Learning*. Retrieved from iNACOL website: http://www.inacol.org/research/promisingpractices/NACOL_PP-FundPolicy-lr.pdf

- Governor's Task Force on Transforming Education in Kentucky. (2011, February). *Breaking New Ground: Final report of the Governor's Task Force on transforming education in Kentucky*. Retrieved from: http://kytech.ky.gov/TEK_final_report_draft.pdf
- Holliday, T. (2011, August 26). *Digital Learning in Kentucky*. Retrieved from <http://www.education.ky.gov/NR/exeres/E5A14589-4DBB-4260-80F8-E679CBBC3D71.htm>
- Holliday, T. (2011, September 9). *Digital Learning in Kentucky*. Retrieved from <http://www.education.ky.gov/KDE/Administrative+Resources/Commissioner+of+Education/Commissioner+Holidays+Blog/Digital+Learning+in+Kentucky.htm>
- Holliday, T. (2011, September 16). *Followup on Digital Summit*. Retrieved from <http://www.education.ky.gov/KDE/Administrative+Resources/Commissioner+of+Education/Commissioner+Holidays+Blog/Follow+Up+on+Digital+Summit.htm>
- Holliday, T. (2011, February). *Next Generation Teaching and Learning through Technology*. GRECC Technology and Leadership Summit.
- Holliday, T. (2011, April 22). *Next Steps for Transforming Education for Kentucky Task Force*. Retrieved from: <http://www.education.ky.gov/KDE/Administrative+Resources/Commissioner+of+Education/Commissioner+Holidays+Blog/Next+Steps+for+Transforming+Education+in+Kentucky+Task+Force.htm>
- Horn, M & Staker, H, Innosight Institute (2011, January) *The Rise of Blended Learning*. Retrieved from: <http://www.innosightinstitute.org/innosight/wp-content/uploads/2011/01/The-Rise-of-K-12-Blended-Learning.pdf>
- Innes, R.G., Bluegrass Institute for Public Policy Solutions. (2011). *Digital Learning Now: Obstacles to Implementation in Kentucky*. Retrieved from: <http://www.freedomkentucky.org/images/8/80/DigitalLearningNow.pdf>
- Innes, R.G., Bluegrass Institute for Public Policy Solutions. (2010). *Virtual Schooling Kentucky: Great Promise with Challenges*. Electronic resource.
- Jefferson County Public Schools. (2011). JCPS eSchool. Retrieved from: <http://www.jefferson.k12.ky.us/Programs/eSchool/index.html>
- Kentucky Council on Postsecondary Education. (2011). Distance Learning. Retrieved from: <http://cpe.ky.gov/info/distance/index.htm>
- Kentucky Council on Postsecondary Education. (2011). *Kentucky Adult Education Learning for Life*. Retrieved from: <http://www.kyae.ky.gov/>
- Kentucky Council on Postsecondary Education. (2011). *KY Virtual Campus*. Retrieved from: <http://www.kyvu.org/>
- Kentucky Department of Education. (2006). *2007-2012 Education Technology Master Plan*. Retrieved from:

<http://www.education.ky.gov/KDE/Administrative+Resources/Technology/Master+Plan>

Kentucky Department of Education. (2006). *2007-2012 Education Technology Master Plan Budget*. Retrieved from: <http://www.education.ky.gov/KDE/Administrative+Resources/Technology/Master+Plan>

Kentucky Department of Education. (2006). *2007-2012 Education Technology Master Plan Appendix*. Retrieved from: <http://www.education.ky.gov/KDE/Administrative+Resources/Technology/Master+Plan>

Kentucky Department of Education. (2011) *Unbridled Learning – College and Career Readiness for All*. Retrieved from: <http://www.education.ky.gov/KDE/Administrative+Resources/Commissioner+of+Education/Unbridled+Learning/>

Kentucky Educational Standards Board. (2011). *EPSB KyEducators.org*. Retrieved from: <http://www.kyeducators.org/>

Kentucky Educational Television (KET). (2011) *KET Distance Learning with a Personal Touch*. Retrieved from: <http://www.dl.ket.org/>

Kentucky Virtual Library. (2011). Retrieved from: <http://www.kyvl.org/>

KY Virtual Schools. (2008). *2008 AP Exam Summary Report*. Electronic resource.

KY Virtual Schools. (2009). *2009 AP Exam Summary Report*. Electronic resource.

KY Virtual Schools. (2008, July). The Learning Depot. *KVS Chronicles*. Retrieved from: <http://apps.cpe.ky.gov/depot/marketing/kyvsjulynewsletter20080804.pdf>

Project Tomorrow (2010, April) *The New 3 E's of Education: Enabled, Engaged, Empowered*. Retrieved from: [http://www.tomorrow.org/speakup/pdfs/SU10_3EofEducation\(Students\).pdf](http://www.tomorrow.org/speakup/pdfs/SU10_3EofEducation(Students).pdf)

School Digger. (2011). *Russellville Virtual Learning Academy*. Retrieved from: <http://www.schooldigger.com/>

State Education Technology Directors (SETDA). (2005). *A State Profile: Kentucky. Enhancing Education through Technology, NCLB Title II, Part D: Year Three in Review*. Retrieved from: http://www.setda.org/c/portal/layout?p_1_id=PUB.2198.1

University of Kentucky. (2011). *Distance Learning Programs*. Retrieved from: <http://www.uky.edu/DistanceLearning/>

Watkins, Tom. (2005). *Exploring E-learning Reforms in Michigan: The New Education (R)evolution*. Retrieved from iNACOL website: <http://www.inacol.org/research/docs/e-learningreport.pdf>

Watson, J., North American Council for Online Learning (NACOL). (2008) *Promising Practices in Online Learning; Blended Learning: The Convergence of Online and Face-to-Face Education*. Retrieved from NACOL website:
http://www.inacol.org/research/promisingpractices/NACOL_PP-BlendedLearning-lr.pdf

About the Authors

Tom Vander Ark - CEO, Open Education Solutions

Tom Vander Ark is CEO of Open Education Solutions, a blended learning service provider. Previously he served as President of the X PRIZE Foundation and was the Executive Director of Education for the Bill & Melinda Gates Foundation where he implemented \$3.5 billion in scholarship and grant programs. Tom was the first business executive to serve as public school superintendent in Washington State. Vander Ark is the author of *Getting Smart: How Digital Learning is Changing the World* and blogs daily at GettingSmart.com.

Tom is a director of the International Association for K-12 Online Learning (iNACOL), and several other nonprofits. Tom received the Distinguished Achievement Medal and graduated from the Colorado School of Mines. He received his M.B.A. in finance from the University of Denver. He continues his education online.

Bryan Setser - Chief Innovation Officer, Open Education Solutions

Bryan Setser is Chief Innovation Officer at Open Education Solutions, a blended learning service provider. In his former roles, Bryan revitalized and transformed the North Carolina Virtual School into a national model for e-learning serving over 50,000 students annually. As Chief Quality Officer, the American Productivity and Quality Council recognized his school district as a Malcolm Baldrige National Award Winner and a national best practice staff development site.

A master motivator and innovator, Dr. Setser has served on numerous national reform efforts including the National Digital Learning Council, the iNACOL State Leadership Team, NC Education Cloud Team, and the State Virtual Leaders Alliance. Two separate Governors in North Carolina have twice appointed him to the E-learning and School Technology Commission. Dr. Setser has served at every level of k-12 education as an award winning teacher, principal, and assistant superintendent.

Don Hall - Consultant, Open Education Solutions

Don serves as the Chief Information Officer for the 34,000-student Muscogee County School District in Columbus, GA. As a career educator with over 20 years experience in teaching and administration at the K-12 and University level, he has previously held senior leadership roles within the General Electric (GE) Corporation and the Kentucky Department of Education. Don is a veteran conference presenter at the national and international level, published author, and experienced consultant. Don is author of *The Technology Director's Guide to Leadership: The Power of Great Questions*.

In recognition of his contributions to public education, he was presented the 2006 Educational Technology Leader of the Year Award by the Technology and Learning journal, and was runner-up for the 2006 David Kearns National Public School CIO of Year Award.

Appendix A - Glossary of Terms

Access device: An item of Information and Communications Technology (ICT) equipment that is used directly by students, teachers or school staff. Access devices include: desktop and laptop computers, tablets, and smart phones

Adaptive content: Digital instructional materials that adjust difficulty based on user responses.

Application software: Software used for a specific application. Schools use the software for teaching, learning or administration. Examples include: learning management systems, finance and assets systems, staff and student management systems, assessment and reporting systems.

Assessment and reporting system: Application software used by schools to support the management of student assessment and reporting.

Asynchronous: Communication that is separated by time such as email or online discussion forums; it may be accessed from multiple settings (in school and/or out of school buildings).

Bandwidth: A measure of how much data can be transferred through a network connection.

Blended learning: Combines online learning with other modes of instructional delivery including onsite instruction; it involves a shift in delivery to an online or computer-based environment for at least a portion of the day with the goal of improving learning, staffing, and/or facilities productivity.

Broadband: A higher capacity network connection capable of providing access to a richer set of resources.

Content management system: Application software to manage digital content.

Digital content: Material including text, audio, still image and video resources, which are recorded in a digital form and made available using ICT tools.

Digital content repository: An electronic 'place' where digital content is stored. Digital content repositories are sophisticated databases with software for creating, importing, managing, retrieving and distributing digital content.

Digital learning: Any type of learning that is facilitated by technology.

Digital portfolio: A collection of digital 'evidence' assembled and managed by a student or other person. Digital portfolios can be both demonstrations of the person's abilities and platforms for self-expression. They can also be seen as a record that provides evidence of learning achievement.

eLearning: 'Electronic' learning, particularly learning that uses digital resources.

Full-time online schools: Also called cyber or virtual schools, work with students who are

enrolled primarily (often only) in the online school. Online schools typically are responsible for their students' scores on state assessments. In some states most full-time online schools are charter schools.

Hybrid learning: Often used synonymously with blended learning; typically refers to blending multiple modes of learning - combining online and on-site pedagogies and materials within the same classroom.

Interactive whiteboard: An access device with a large 'whiteboard' that acts as a computer display screen. People can interact with the whiteboard using special 'pens'. Interactive whiteboards are effective tools for the teaching of groups.

Learning Management System (LMS): Includes content management, communications tools, instructional tools, gradebook and assessment features.

Multimedia: A resource made up of a combination of multiple types of media, including text, audio, still image and/or video resources.

Online learning: Instruction via a web-based educational delivery system that includes software to provide a structured learning environment. It can be a teacher-led education that takes place over the Internet, with the teacher and student separated geographically (also cyber learning, e-learning, distance learning).

Open source: A general type of license that makes resources such as software and digital content available to the general public with relaxed or non-existent copyright restrictions.

Pod casting: The distribution of 'broadcast' material in digital form over the internet for playback on portable media players and computers.

Server computer: A computer that hosts tools, resources and software used throughout the school. Server computers are connected to access devices such as desktop and laptop computers through the school's network infrastructure. Server computers are generally located outside learning areas and are often placed in special server rooms.

Social learning: Like Facebook for schools, social learning platforms provide a messaging and content sharing among groups. Leading platforms manage privacy issues.

State-led online initiatives: Typically offer online tools and resources for schools across the state but do not have a centralized student enrollment or registration system for student in online courses.

State-virtual schools: Created by legislation or by a state-level agency, and/or administered by a state education agency, and/or funded by a state appropriation or grant for the purpose of providing online learning opportunities across the state.

Supplemental online programs: Provide a small number of courses to students who are enrolled in a school separate from the online program.

Synchronous: Communication in which participants interact in real time such as videoconferencing.

Tablet computer: A mobile computer that enables the user to 'write' directly onto the screen.

Virtual classroom: Place for instructors and students to interact and collaborate in real time (synchronously). Using webcams, chat boxes and class discussion features, it resembles the traditional classroom, except all participants are accessing it remotely over the Internet.

Web browser: A software tool which enables a user to display and interact with digital content located on a web page at a website.

Wiki: A collection of web pages designed to enable anyone who accesses it to contribute to it or to modify its content. Wikis are often used to create collaborative websites.

(from Digital Learning Now 2010 and www.digitaleducationrevolution.gov.au)

Appendix B - Acknowledgements

As with any comprehensive effort, this report is possible because of countless individuals who gave generously of their time and expertise. Kentucky is fortunate to have many educational leaders and digital learning advocates and experts. Please accept our apologies in advance if anyone has inadvertently been overlooked. Special thanks are extended to these educational leaders and e-learning pioneers:

Kentucky Department of Education

Terry Holliday	Commissioner	Department of Education
Dewey Hensley	Associate Commissioner	Department of Education
Felicia Smith	Associate Commissioner	Department of Education
David Couch	Associate Commissioner	Department of Education
David Cook	Innovation Director	Department of Education
Bon Fortney	Senior Consultant	Department of Education
Charlie Harmon	Director of Finance	Department of Education
David Cook	Director of Innovation	Department of Education
Michael Daily	Director of NG Learning	Department of Education
Marty Park	KIDS Regional Engineer	Department of Education
Charlotte Chowning	KIDS Regional Engineer	Department of Education
Seth Hunter	Regional Content Math	Department of Education
Johnny Collett	Asst. Director of Special Ed	Department of Education
Melissa Ferrell	Consultant	Department of Education

Kentucky Public Schools

Jimmy Adams	Director of High Schools	Jessamine Central Office
Jana Hickey	e-school JCPS	Jefferson Central Office
Benny Lile	Asst. Superintendent	Barren Central Office
Amanda Wright	Director	Bavel Academy
Amy Johns	Director of Technology	Fayette Central Office
Jeanne Biddle	ISTE National Officer	Scott Central Office
Tommy Floyd	Superintendent	Madison Central Office
Vicki Fields	CIO	Kenton Central Office
Henry Webb	Superintendent	Floyd Central Office
Artie Dietz	Asst. Principal	Jefferson Central Office
Carmen Coleman	Superintendent	Danville Central Office
Beckie Brown	Special Ed Teacher	Scott County Schools
Betty Moore	Director of Special Ed	Jackson Central Office
Paula Roberts	Asst. Superintendent	Owensboro Central Office
Caleb York	Principal	Daviess Elementary
Lee Jordan	District Technology	Bowling Green Schools
Robert Forsythe	District Technology	Warren Central Office
Amanda Henderson	Technology Teacher	Graves County Schools
Denise Adams	Staff	The Providence School
Clay Dawson	Staff	Kenton Success Academy
Bill Mattingly	Staff	Taylor Virtual Learning
Garet Wells	Staff	Wofford Safe Harbor
Roger Cook	Superintendent	Taylor County Central Office

Bryan Cook	Principal	Taylor County Charter Academy
------------	-----------	-------------------------------

Higher Education

Dave Foreman	Instructor	Georgetown College
Kim Code	Instructor	Northern Kentucky University
Thomas Guskey	Professor Emeritus	University of Kentucky
Linda France	Director – NC Partnerships	University of Kentucky
Eve Profitt	Director P-20 Innovation	University of Kentucky
Justin Bathon	Associate Director	University of Kentucky
Carol Gabbard	Gear Up Project	Eastern Kentucky University
Ron Milliner	Director	Murray State University
Ben Malphrus	Department Chair	Morehead State University
Gerry Swan	Assistant Instructor	University of Kentucky
Signe Dunn	Plato Coordinator	CPE
John Nash	P-20 Castle Team	University of Kentucky

Kentucky Virtual Staff

Grace Yeh	Blackboard Administrator	Kentucky Virtual High School
Allene Frederick	Math Teacher Science	Kentucky Virtual High School
Tresine Logsdon	Teacher Former Staff	Kentucky Virtual High School
Kiley Whitaker	Member Former	Kentucky Virtual High School
Linda Pittenger	Director Former	Kentucky Virtual High School
Robert Hackworth	Teacher Former	Kentucky Virtual High School
Kiley Whitaker	Teacher Former	Kentucky Virtual High School
Beth Gaunce	Teacher	Kentucky Virtual High School
Norka Ratnavale	Professional Developer	Kentucky Virtual High School
Ghenna Chernavski	Math and Science Teacher	Kentucky Virtual High School
Melanie Stamper	Science Teacher	Kentucky Virtual High School
Lucinda Sanders	Teacher	Kentucky Virtual High School
Kevin Crump	Science Teacher	Kentucky Virtual High School
Rex Hanson	Teacher	Kentucky Virtual High School
Anne Robins	TEAM KDE	Kentucky Virtual High School
Tara Rodriquez	TEAM KDE	Kentucky Virtual High School

Partners

Jena Collins	Strategic Partnerships	Apple Computer Company
Nancy Carpenter	Senior Education Director	Kentucky Education Television
Diane Goodwin	Library Specialists	Ohio Valley Education Coop
Lisa Jackson	Online Unit	KCTCS
Rene' True	Executive Director	Connect Kentucky
Shea Hopkins	Executive Director	Kentucky Education Television
Dara Bass	Policy Specialist	Kentucky School Board Assoc.
Chuck Duncan	Online Physics Teacher	Kentucky Education Television
Marcie Lowe	Executive Office	Education PS Board
Barbara Treacy	Director	Education Development Center
Wayne Young	Executive Director	Kentucky Assoc. of School Admin

Alan Lynn John	Vice President	Technology and E-learning
Krueger Woodrow	German Online Teacher	Kentucky Education Television
Carter Kim Walters	Engagement Manager	School Net
Parker Enid	Director	Ed Professional Standards Board
Wohlstein	Director	Kentucky Virtual Library
Stu Silberman	Director	Prichard Committee
Bryan Setser	Chief Innovation Officer	Open Education Solutions
Jeff Gray	Support Technician	Kentucky Education Television
Sandra Cook	Chancellor's Office	University of Kentucky
Jeff Hawkins	Director	Kentucky Valley Education
Jeff Jones	KySTE President	KySTE
Shirely LaFavor	Director of PD Ed	Kentucky Assoc. of Admin
Brian Spellman	Outreach Engagement	Kentucky Education Television
Christina Winter	Manager President	School Net
Carolyn Witt Jones	Executive Director	Partnership for Successful Schools
Richard Innes	Consultant	Blue Grass Institute
Amanda Dawahare	Consultant	Kentucky Education Television
Paige Brooks-Jeffers	Deputy Director	KCTCS
Rhonda Caldwell	Vice President	Kentucky Assoc. of School Admin
Randall Greenway	Latin Teacher	K12 Inc.
Ann Denny	Technology	Kentucky Education Television
Dave Hempy	Distance Learning Manager	Kentucky Education Television
Lynda Thomas	Director	Kentucky Education Television
Beverly Raimondo	CEO	Prichard Committee
Tom Vander Ark	Consultant	Open Education Solutions Open
Don Hall	Research Director	Education Solutions Kentucky
Mona Ball	Technology Specialist	Education Association
Nathan Prather	Acting Executive Director	Kentucky School Board Assoc.
Susan Sandage	Director	Kentucky Council on Economic Ed
Terri Stice		Green River Region Education

Students

Devon Foster	Kentucky Virtual	Bavel
Maxwell Gregory	KentuckyVirtual	Bavel
Jeri Howell	Kentucky Virtual	Frankfort High School
Coty Lowe Shaylin	Kentucky Virtual	Bavel
McGuire Robert	Kentucky Virtual	Bavel
Plummer Valerie	Kentucky Virtual	Fleming County High School
Sage Lindsey	Kentucky Virtual	Paul Lawrence Dunbar HS
Tennyson	Kentucky Virtual	Bavel

Appendix C - Feedback Form

Open Ed Solutions has created an open Google Form to be utilized by the Kentucky Department of Education as they take this report's recommendations to the Kentucky State Board of Education and the Kentucky General Assembly. You can access the form here to participate and provide your input:

<https://docs.google.com/spreadsheets/viewform?formkey=dENsd3NRZ01OMW1fbVgyNmRoTUVWUXc6MQ>