

Kentucky Education Technology System: An Analysis

Office of Knowledge, Information, and Data Services (KIDS)

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Introduction

The Kentucky Education Technology System (KETS) is a direct result of the 1990 Kentucky Education Reform Act. Components of KETS include, but are not limited to, development of technical standards for statewide systems, the provisioning of technical services, high speed network access, and the funding of technology strategies to support the learning environment.

A plan to describe the technology vision for Kentucky schools is also a crucial KETS component that in present day continues to drive decisions and lay the groundwork for increased use of state-of-the-art technology in instruction. Accordingly, the [2013-2018 KETS Master Plan](#) (hereafter referred to as the “Master Plan”) describes how technology will be used to improve teaching and learning for all of Kentucky’s children. The Master Plan builds upon past successes and defines a path that will enable all students to understand and leverage technology to enhance their learning experiences. It extends instruction beyond traditional school walls and leads students to awareness that every opportunity is available to them.

The Kentucky Department of Education (KDE) is a service agency of the Commonwealth of Kentucky. KDE provides resources and guidance to Kentucky’s 174 school districts and more than 1,200 public schools. The department also serves as the state liaison for federal education requirements and funding opportunities.

Major Accomplishments of KETS

Kentucky Education Network

In recent years, Kentucky has made significant strides with the state-wide infrastructure for education. The Kentucky Education Network (KEN) was funded by the Legislature in the FY2007 and 2008 biennium in order to revolutionize the level of Internet access that students, teachers, and administrators had to online resources and to KETS shared services. It was the foundation to leverage the concurrent funding for the Instructional Device Upgrade¹.

A seamless, education-centric network that equitably supports lifelong learning for all Kentuckians, KEN continues the vision of ensuring every public Kentucky school has a high-speed connection to the Internet. KEN is a major upgrade, in terms of speed and reliability, over the previous generation, which was itself a first in the nation. As more and more opportunities for our students open up via online content, KEN is ready to grow with those opportunities, and provide reliable 24/7 access.

Although KEN was a solid first step in providing the level of Internet access needed to address the previous years of stagnant funding, the pent up demand, the continual growth of online resources, and the move to cloud computing has all but negated the gains achieved in the previous five years. Nevertheless, this foundation has allowed KDE to realize additional achievements that set Kentucky apart in the area of education technology.

¹ Outlined within Additional State Achievements section

Just a few of the initiatives that KDE believes make a difference in the educational environment for students, educators and administrators are listed below. Each of these were either developed and implemented by KDE in conjunction with Kentucky's schools, districts, and partners or were made possible by the network access and foundation we have put in place. Kentucky's systems approach to educational tools ensures that all of the Commonwealth's students get the best of breed at the best price. More information can be found about each on the Department's [website](#).

Additional Statewide Achievements

The following summary of KETS accomplishments serves as an example of the positive impact that technology-enabled solutions can have within Kentucky's education environment.

MUNIS to the Cloud - MUNIS is the financial software package used in all 174 Kentucky School districts. Originally implemented at the local level statewide in 1997, MUNIS will complete a transition to a cloud-based service in 2012, increasing security, reliability, and functionality.

Instructional Device Upgrade (IDU) - Not only a project to replace/purchase instructional devices for the students and teachers throughout Kentucky, the IDU upgrade also promoted the advancement of student learning through new instructional technologies.

Individual Learning Plan (ILP) - Beginning in the 6th grade for all Kentucky students, the ILP helps students explore career possibilities, set goals and track their own educational progress against those goals.

Kentucky Student Information System (KSIS) - KSIS is provided by Infinite Campus, and, like the financial software, is standard across every public school district in Kentucky. Having a single SIS allows for an unprecedented amount of standardization and vertical integration of data statewide. In addition to reducing training and support costs, reports and analytics can be easily developed at the state level and pushed to districts. Like MUNIS, KSIS has recently moved to the cloud and will utilize the latest in web-based technologies to provide access to teachers, administrators, and parents.

KET Encyclomedia - A partnership with KET and Discovery Education, KET Encyclomedia is a comprehensive online multimedia learning service offering downloadable/streamable video, still photos and clip art, quizzes and lesson plans, and many related resources.

Live@edu - Kentucky was the first state to adopt Microsoft's next generation email and collaborative suite, consisting of a hosted email offering for students, educators and administrators and web-based collaborative tools. Feature-rich and highly supportable, this set of tools is the first step toward even greater functionality to be delivered within coming years.

Open House - KDE's Open House is the single stop for data from multiple educational applications, such as the Kentucky Student Information System, MUNIS and other sources, including the state assessment system. Reports derived from these sources are provided within Open House for all stakeholders within the Commonwealth.

Student Technology Leadership Program - The Mission of the Student Technology Leadership Program (STLP™) is to advance individual capabilities; to motivate all students; and to create leadership opportunities through the use of technology.

Continuous Instructional Improvement Technology Systems (CIITS) - CIITS will connect standards, electronically stored instructional resources, curriculum, formative assessments, instruction, professional learning and evaluation of teachers and principals in one place, thereby improving instructional outcomes, teacher effectiveness and leadership.

Executive Summary

The Master Plan represents the vision for KDE's Information Technology (IT) goals and objectives. It will be updated as needed to reflect emerging standards, requirements, and initiatives as well as to maintain alignment with the Annual Expenditure Plan process. This will ensure that the IT goals and objectives will remain aligned with the Department's mission and values and that it supports the academic and administrative requirements of Kentucky's public schools and districts.

The Master Plan, and more importantly, the vision within, is guided by and must remain relevant to, the tenets and direction set forth by the Kentucky Board of Education (KBE) and KDE. Those requirements, in summary, are:

- **Accountability** – Implement a new accountability model and balanced assessment system with four components – Next-Generation Learners; Next-Generation Professionals; Next-Generation Instructional Programs; and Next-Generation Schools and Districts.
- **Academic Standards** – Adopt new academic standards. Common Core State Standards (CCSS) provide a consistent, clear understanding of what students are expected to learn in K-12 English/language arts and mathematics
- **Program Reviews** – Hold schools and districts accountable for how well they support learning.
- **College/Career Readiness** – Reduce the percentage of students needing remedial work in college by focusing on acceleration, interventions, advising, and postsecondary intervention options. Ensure the preparedness of students who choose to enter the work force upon completion of high school.

In order to support the overall mission of the Kentucky Board of Education, KDE will:

- **Be Involved** by participating at every level with the planning and implementation of KDE business goals
- **Involve the Correct People** by ensuring that Kentucky's districts and schools are given representation in decisions made regarding IT.

- Increase Transparency by providing appropriate access to its own processes and information and providing methods by which other KDE Offices may do the same.
- Transform Information Assets by assisting Kentucky's schools, districts and KDE to improve the accuracy and reliability of data as well as finding new ways to use existing data.
- Increase Efficiency through thoughtful and appropriate utilization of cloud technologies, centralized administration, and competitively bid contracts taking advantage of Kentucky's economy of scale buying power. Increased efficiency will also require increased flexibility on the part of the organization to find solutions that might not fit within established models.
- Increase Access to Essential Services by continuing to support initiatives providing secure anytime/anywhere access to the resources required by students, educators, and staff for their day-to-day needs and decision-making processes.
- Look toward the Future by establishing new strategic partnerships while continuing to grow existing ones.

While there are numerous trends in the education technology arena, the Master Plan provides guidance for districts to thoughtfully incorporate those that are most applicable to Kentucky's goals for our students and that best take advantage of our existing environment.

Part of Kentucky's success is due to the benefits that come with development and implementation of strategic plans. This process ensures the critical examination of unmet need takes place and then that the best possible solution can be deployed. We are fortunate to have in place a strategic plan for education, approved by the KBE that ensures schools are provided the resources necessary to give every student what they need anytime, anywhere.

Whether your role in this environment is that of student, educator, administrator, parent, lawmaker or citizen, your participation is important. If you are already involved with education, thank you. If not, we encourage you to get involved at your local school for what will undoubtedly be an exciting next few years!

Technology's Role in the Education Environment

The historical model of America's learning environment elicits visions of the traditional classroom, neatly organized with rows of forward-facing seats directed toward a "stage" with teachers assuming the starring role, commanding the attention of their audiences to the best of their professional ability.

Over the course of several years, the backdrop of this stage has evolved from a blackboard to a whiteboard, and even to an interactive whiteboard. However, just as some private sector organizations have been slow to adopt and support tablet devices (such as iPads™) in the boardroom, America's education industry continues to steadfastly hold on to a model that pushes our nation further behind the curve of the global scale in the era of technology. Since 1970, the amount of money spent per child in education has nearly doubled, while global rankings in the areas of math and science have declined. It is estimated that by 2020, 123 million American jobs will be in high-skill/high-pay occupations, from computer programming to bioengineering, yet only 50 million Americans will be qualified to fill them. (Weber, 2010)

In parallel with the national education scenario, the use of technology has rapidly permeated our society, most notably in the form of consumer devices. Innovative tools continue to evolve at an escalated pace, with the transition of cell phones and laptops to "smart" phones and tablets which are hybrid devices that in present day, appear to provide the user with complete connectivity to the anytime, anywhere, collaborative social experience. Perhaps it is the parents of our future generation that are the first to realize and therefore leverage the benefit by providing elementary school-aged children with cell phones, smart phones, tablets, and other handheld devices. After all, most parents want their children to be knowledgeable of social trends beyond the classroom. From the moment that our children begin asking "why", parents, educators, and professionals wish to continue providing the answers to the best of their ability.

The integration of technology into our daily lives has enhanced the capability for adults to answer these basic yet essential questions and the most popular search engine has evolved into an official verb. The Internet is a powerful, collaborative tool that when used responsibly, ethically, and thoughtfully can enhance our lifelong learning experiences beyond those available to previous generations.

As a result of society's evolution, acceptance of this technological revolution, and the innate need to provide answers, parents that have the means to do so are providing their children with smart devices. While it may not be the primary purpose, some parents are also armed with the knowledge that these

Our vision is an education that maximizes every child's potential for learning, prepares every child with the 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.

Forward: "Digital Learning Now"
(OpenEd Solutions)

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

devices have the capability to facilitate the learning environment. This practice creates a direct conflict with administrators and educators that continue to insist that these devices create distractions within the learning environment.

In reality, distractions to the learning environment have always been present. These distractions have quite simply evolved from passing notes on paper or disguising a magazine within an old-fashioned notebook to mobile devices that are carried by 6 billion citizens worldwide as of 2011 (International Telecommunication Union). These numbers will continue to climb rapidly as mobile devices continue to be the preferred method of connectivity to information.

All involved in Kentucky's education system (parents, educators, and administrators) should consider leveraging the capabilities that exist in order to be successful and competitive in the new technology-driven world economy. The devices themselves should not be considered the distraction, but rather a key component toward an enhanced learning environment for the 21st Century. With the right experience, instructional support, and access, students and teachers can benefit from these tools in the classroom.

The Model for Education Technology in Kentucky

Kentucky continues to realize progress with not only the integration of technology into its educational environment, but also ensuring alignment of best practices, recommendations, and strategies at the national, state, and local levels. At the center of all efforts is enhancement of the learning experience within K-12.

Strategic Alignment

Direct support of KBE's strategic priorities have been formulated in actionable plans with both strategic and tactical components designed to ensure quality Next Generation Learners, Professionals, Schools/Districts and Support Systems. All Kentucky public school districts as well as the Department take advantage of KDE-provided services that are focused on Kentucky's educational needs while balanced with industry trends and best practices.

The National Education Technology Plan (US Department of Education) provides recommendations for states to enhance the learning environment by recognizing and leveraging the power of recent as well as emerging technological advances. The "Model of Learning Powered by Technology" provides a framework for all states to follow in order to align with 21st Century Readiness initiatives and in support of transforming education in America.

The KETS model depicted in Figure 1 portrays the current and evolving industry trends that lead to content and also form the associated strategic directions at the national and state levels. The overarching theme of "ubiquitous access" is intended to reflect that the variety of tools and methods of connectivity utilized to access content, while ever-present, should be irrelevant to the users within the learning environment. This content and connectivity can take many forms, but ultimately should be attainable anytime, anywhere, and from any device. The core principles and standards at the center of

this support model are intentionally applied in conjunction with all technology-enabled strategic and operational initiatives originating from any office within KDE. It is the goal of KETS to align with not only the KBA Strategic Plan in support of 21st Century learning, but ultimately that of each district, school, and classroom.

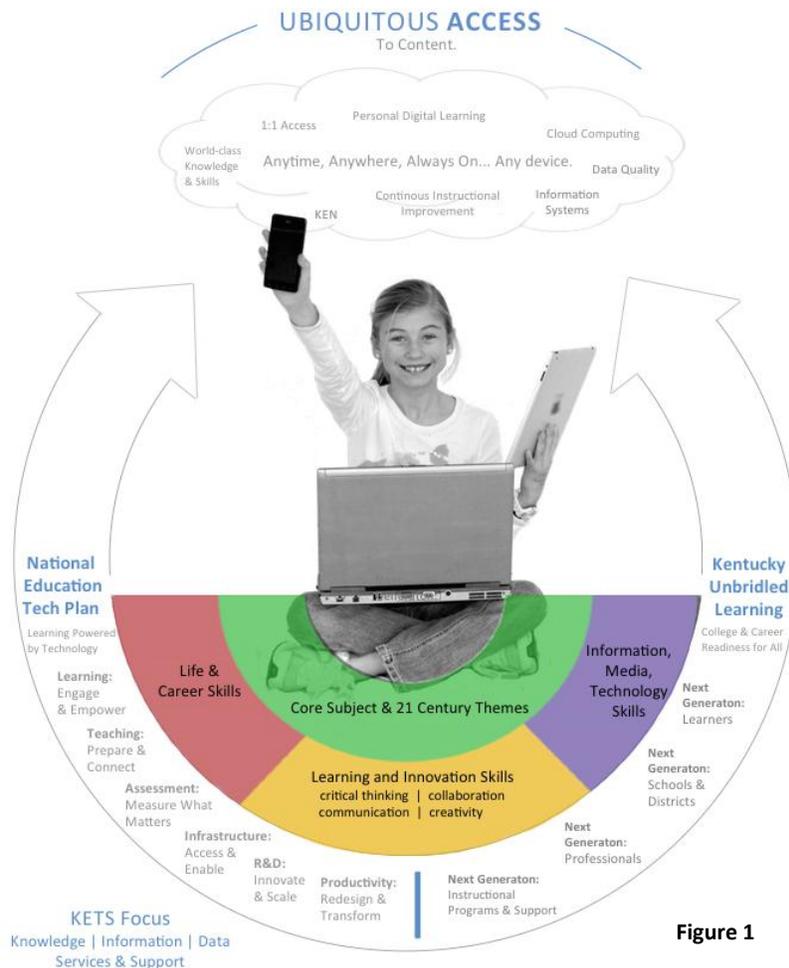


Figure 1

Current and Emerging Trends in Education Technology

It is important to recognize and acknowledge trends that occur within any industry and give thoughtful evaluation toward their applicability into the associated environment. With consideration toward the changing climate of the skills required for our nation’s future workforce, KDE’s technology professionals strive to infuse trends with business or educationally sound initiatives that have direct impacts on efficiency, the student, the classroom, and the educator. Recommendations for innovation can originate from within the department itself, a district, or a school in order to pilot and evaluate new technologies. Simply put, the process of incorporating the latest trends is a thoughtful one, intended to ensure long term rewards for our next generation learners as opposed to being “first to market” the latest fad.

While there are numerous and dynamic technology trends that can have a direct and/or indirect impact on the K-12 education environment, this plan will focus on those that have been deemed to be the most

prevalent and far-reaching from a long-term strategic planning perspective. While many references could be cited, the primary source for this section is Gartner's Hype Cycle for Education (Lowendahl, 2011).

Mobile Devices and 1:1 Initiatives

At present, perhaps the most obvious and pervasive technology trend within education is the same as that of all other industries, both public and private: the overwhelming ownership and use of mobile devices. Also referred to as the "Consumerization of IT", all industries are realizing that the historical standard support models that have ensured centralized management and security of data transmissions are rapidly being overcome by the demands of professionals as well as learners for access to information, anytime, anywhere, and from any device. This rise in consumerization creates the need for IT professionals in all areas (public or private) to either relax their security standards significantly (which is rarely an option due to various and stringent legislative/regulatory requirements) or to quickly become more agile in order to strike a balance between the typical "need to know, need to have" models of protecting information assets with the on-demand nature of societal technology trends. In the simplest of terms, if secure access is not enabled and supported by the organization, employees and other users will "find a way", leaving the organizations or corporations responsible for data leakage and garnering major negative headlines.

One need only consider the rapid rise from innovation to industry acceptance of consumer demand regarding how music is delivered to understand that the Connected Age is well underway. At the time that the 2007-2012 KETS Master Plan was drafted, a fair amount of consumers were still purchasing physical media in the form of CDs to enjoy their favorite tunes, though the numbers were on a decline. Our 21st Century generation will have limited knowledge of physical media for music beyond historical references gleaned from the Internet. Today's music has become primarily digitized and is readily available on demand for immediate download to the same mobile devices that many consumers use to surf the Internet, update social media status, and place phone calls; the same devices that always keep them connected to everyone, anytime, and anywhere.

This situation did not occur overnight or without a major disruption within the music industry. Leaders within the IT field recognize this mechanism for change as "disruptive innovation" – a concept so foreign to the daily operations that those involved experience a period of vehemently fighting back before finally giving in to the change and adjusting course to accommodate the change. Over what in retrospect has been a rapid timeline, the music industry has conceded that modern society lives within an on-demand world. Consumers will no longer tolerate the album mentality of a few good songs sprinkled with sub-standard fillers and therefore, we now have access to an a la carte approach, picking and choosing what we like and paying only for that.

What this comparative example means to education is that the traditional methods and associated media used in the learning environment are also evolving rapidly. These advances must be acknowledged by all involved as adjustments are made to the associated models and delivery methods. Electronic books (a.k.a. "e-books") are fast becoming as readily and widely available as music files within the consumer industry; a trend in particular that negates the need for students to weigh themselves

down by toting backpacks loaded with traditional textbooks. Will we soon be experiencing a shift within the textbook industry toward electronic delivery to any portable device that can be updated much more rapidly through a download than through the current print cycles that span years? Will suppliers finally realize that the expense to produce electronic versions to meet consumer demand should be drastically reduced?

The trend is already upon us. However, this trend **does not** mean that teachers will soon be replaced by devices. On the contrary, human interaction and guidance should continue to play a pivotal role in every child's development. The savvy parents and educators will demonstrate willingness to embrace our society's technological advances, leveraging the associated tools (in whatever form these tools may take). Ensuring the appropriate resources are accessed can lead our future generations along the path toward becoming successful contributors to society, beginning with college and career readiness. The trends that have been introduced to those of us from generations other than the 21st Century quite simply indicate that we need to embrace change and adjust our thought processes accordingly, much in the same way that we have adjusted the manner in which we enjoy our music, books, favorite television shows, and movies.



"Woodford students get iPads, join iTunes U platform" – courtesy of Kentucky.com

(Kocher, 2011)

Kentucky's schools are actively moving forward with embracing innovative technologies in the classroom, as evidenced by several recent 1:1 initiatives. In accordance with industry trends, 1:1 refers to the ratio of technology devices to students and teachers/administrators. While previous target ratios have focused on computer labs or even laptop computers that provide mobile capabilities, the tablet computer has recently become the focus at the school level due to their popularity with students and flexibility with educators in delivering core curriculum. Moreover, the incorporation of tablet devices into the 1:1 concept provides the educational system with the opportunity to explore alternatives to traditional textbooks, just as many consumers are realizing the benefits of immediate gratification and potential cost savings realized by downloading e-books.

Rather than dictate the standards and guidelines under which such initiatives can be implemented, the role of KDE is to support the continued integration of technology into the classroom, striving to provide guidance, infrastructure support, and incorporation of best practices, particularly in the areas of policy and professional development. This support is evidenced in the form of associated policies and procedures to any district seeking to implement a 1:1 initiative or otherwise enhance the ratio of technology instructional devices to students, teachers and administrators.

Cloud Computing

Cloud computing has also become a more prevalent win-win-win situation for all involved in recent years. This accessibility model shifts the overhead of data storage and online availability from businesses and agencies to various trusted partners. The trusted partners involved can in turn offer reduced pricing

to their customers (the businesses and agencies) based on volume service subscriptions, while the volume subscriptions themselves positively impact their profit margins. The customers may report a reduction in annual operating costs. The consumers (customers of the customers, or end users) also reap the rewards of anytime, anywhere access to information. Such information can range the gamut of basic yet essential consumer needs (i.e. music files and family photos on a “sky drive”) to collaborative business tools (i.e. corporate e-mail and financial platforms).

The shift to cloud computing models also includes shared risk mitigation between the trusted partner and customer. Ultimately, “the cloud” is simply another (transparent) method in which access to the same information that would be available from a traditional computer or physical document file is readily available. It is the responsibility of the customer to perform due diligence of the associated service provider(s) prior to migrating any system to “the cloud”.

In recent years and as a result of technology strategic planning efforts, Kentucky has performed cloud migrations of major systems such as e-mail and financial management, receiving recognition in national publications as a result (New Media Consortium, 2011). Moreover, the win-win-win scenario with associated benefits is currently realized.

As KDE continues to create advantageous access to critical systems through cloud migrations, we are directly supporting the anytime, anywhere delivery method in conjunction with national and state-level strategies.

Digital Learning

Digital learning can be delivered through a combination of the above initiatives as well as Web 2.0 collaborative tools such as social media or assessment systems. As a continuance of the anytime, anywhere model, the trend toward digital learning supports the expansion of opportunities such as virtual classrooms, blended learning initiatives and customized content delivery.

Kentucky actively supports the growth of alternate delivery methods within K-12 as evidenced within the December 2011 report, Digital Learning 2020: A Policy Report for Kentucky’s Future (OpenEd Solutions). According to this report, there are Five Shift Propelling Trends toward digital learning environments to facilitate the educational experiences in the U.S.:

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.

Kentucky’s Digital Report Card (Digital Learning Now) demonstrates specific accomplishments with digital learning initiatives. As there is room for improvement, the Digital Learning report outlines recommendations to enhance areas such as access, curriculum and instruction, as well as funding and

infrastructure. As with the previously mentioned national and state level strategies, IT initiatives align with all recommendations related to improving Kentucky's education system's capacity for digital learning.

Incorporating the Human Element of Technology in Education

The use of technology alone cannot produce a positive and transformative effect on Kentucky's education system. Any technology component, unless properly integrated into the business process, is merely a tool sitting in the toolbox, where it has the potential to divert resources from more valuable pursuits or actually hinder progress. This is recognized within all levels of KDE, beginning with the fundamentals of our IT governance structure, which ensures customer input, and continuing through active national involvement and partnerships.

A Focused Governance Structure

The concept of IT Governance can extend from merely meeting tactical obligations with little or no impact, to a large, strategic coordination of effort with other programs that continuously builds on a foundation.

KETS provides the flexibility necessary to enable individual district priorities to be set, while ensuring all are on the same general course. In effect, it ensures both the foundational and tactical needs receive the attention they require, from the classroom to KDE and in between.

It is no small task to establish and maintain effective technology leadership and management across the width and breadth of the KETS enterprise. Consisting of the Kentucky Department of Education, 174 districts and 1,221 schools, direction and course corrections must be systemic, fair, and often carried out within challenging windows of opportunity. This must be accomplished while also adhering to the variety of national, state and local policies that govern education technology.

KDE has in place a governance structure for IT that promotes the communication and collaboration required not only within the IT program, but with those programs using technology to help drive student achievement or those that are otherwise dependent on technology. This is a key concept, as technology, like any other program, does not exist to serve itself, but rather to join, hand in hand, with other programs in order to accomplish the organization's goals.

KDE's Office of Knowledge, Information, and Data Services (KIDS) provides overall guidance for the foundation, structure, and support of how services are carried out, and is led by KDE's Associate Commissioner for Technology, also the KDE Chief Information Officer (CIO). The CIO is responsible not only for the overall vision and leadership of the IT program, but, as importantly, ensuring the right voices are heard from all programs, to help influence the direction of the technology program and increase its efficacy.

The KDE CIO has a counterpart within each of Kentucky's 174 public school districts, with the same responsibilities of vision, leadership, and collaboration. As with the KDE CIO, each district CIO must be

present not only for technology discussions, but for all business decisions that affect the local organization. Governance succeeds, or fails, not due to process or organization, but due to the intrapersonal relationships and understanding built up and maintained over time. These strong working relationships with the other programs ensure confidence in the processes that are set up.

In addition to the need for vision and leadership, successful districts also have someone equivalent to a Chief Technology Officer, or CTO. Working closely with the CIO, the CTO's responsibilities tend to be more tactical and focused on day to day management. The CTO is often more hands on with the technology, while ensuring each component of the overall vision is implemented. It should be noted that in some districts these two roles are performed by the same person, although this is not an ideal situation, due to the amount of time and energy required for both.

While vision, leadership, and management are provided by the CIOs and CTOs, success is achieved through the participation of hundreds of individuals across the state working directly with students and educators to both communicate the vision and provide best practice on how to implement the vision. These persons champion, at every level within the school, educational possibilities brought about by integrating technology into the various programs and see the opportunities that a curriculum infused with technological support can provide to Kentucky's children. Technology Resource Trainers (TRTs) and Student Technology Leadership Program (STLP) Coordinators use the tools and resources provided under the auspices of the plan to ensure that students and educators alike are able to not just simply use technology, but to understand how to design improved learning experiences through the use of technology. Because of the planning and management that takes place beforehand, this is where technology must stop existing as a silo and instead become a vital part of the educational fabric.

Kentucky's Leadership within the Education Technology Industry

Kentucky continues to demonstrate active involvement in a variety of related initiatives at the national level and provides leadership models for enhancing the delivery of technology in education at the state and local levels. This is currently demonstrated within the following activities or designations and continues to evolve.

National Level

- **[International Society for Technology in Education \(ISTE\)](#)** – Technology leadership maintains membership with ISTE and related best practices such as Digital Citizenship. Additionally, active participation in the state's counterpart, KySTE, exists in the form of event presentations at least twice annually to facilitate district-level awareness and professional development within our crucial IT governance structure.
- **[Partnership for 21st Century Skills \(P21\)](#)**² – Kentucky is currently one of 16 states that are certified partners of the P21 initiative that advocates 21st Century readiness for every student to allow the United States to remain competitive in a global economy. Kentucky is recognized as a leader based on the efforts of the P-20 Innovation Lab in partnership with the University of

² Kentucky's Commissioner of Education, Dr. Terry Holliday, currently serves as chair of the P21 State Advisory Committee

Kentucky, as well as its Student Technology Leadership and Kentucky Scholars programs. (Partnership for 21st Century Skills)

- [Consortium of School Networking \(CoSN\)](#) – This organization provides leadership, community, and advocacy tools essential for the success of school district technology leaders.
- [Council of Chief State School Officers \(CCSSO\)](#) – This nationwide organization brings together the top education leaders from every state. Participants are committed to enhancing the nation’s public education system to prepare every child for lifelong learning, work, and citizenship.
- [Gates Foundation](#) – This foundation has established program within the United States exists to prepare all K-12 students to graduate college-ready. Kentucky participates in associated grant programs and related initiatives.
- [State Educational Technology Director’s Association \(SETDA\)](#) – The goal of SETDA is to provide a forum for inter-state collaboration, cooperation, and best practices for educational technology leadership. KDE’s representation in this group supports the strategic direction of technology efforts at all levels.
- [Learning Forward](#) – This organization’s purpose is “to ensure that every educator engages in professional effective learning every day so that every student achieves.” In 2011, Kentucky was selected as a demonstration site to develop a professional development system to support teachers implementing common core standards. (Learning Forward)
- [Southern Regional Education Board \(SREB\)](#) – Kentucky is one of 16 member states that work with this nonprofit, nonpartisan organization to improve public P-12 as well as higher education.

Commonwealth Level

- [Digital Citizenship](#) – This ISTE framework is intended to support a “digital society” of citizens that utilize technology tools in a safe and responsible manner. Kentucky’s schools continue to accelerate their adoption of the nine elements within their technology culture through curriculum or policy, with the most focus in the areas of Digital Access (95%) and Digital Rights and Responsibilities (93%). (Office of KIDS, 2012)
- [Breaking New Ground](#) – In 2009, a task force (Transforming Education in Kentucky) was created by Kentucky Governor Steve Beshear with the goal of creating a unified vision of what schools in the Commonwealth need to offer in order to better serve students today and the future. The resulting report provides 35 recommendations that if implemented will allow significant gains in education, including the use of technology to improve teaching and learning. (Governor's Task Force, 2011)
- [Digital Learning 2020](#) – Several additional recommendations resulted from the creation of this report which identifies Kentucky’s strengths, weaknesses, opportunities and threats regarding digital learning and as also closely aligned with Transforming Education in Kentucky. (OpenEd Solutions)
- [Kentucky Educational Television \(KET\)](#) – KET is Kentucky’s non-commercial television network and the largest PBS state network in the nation. It broadcasts a wide variety of international, national and local programming and is a pioneer in distance learning. In addition to partnerships with other state educational entities, KET partners directly with KDE in order to provide services

such as KET Encyclomedia and the Commonwealth's Unbridled Learning Initiative for College/Career Readiness to Kentucky's P-12 students and educators.

- [iTunes U](#) – A collaborative effort between the University of Kentucky, KET, and KDE, Kentucky on iTunes U provides free curriculum and instructional resources for users, including school districts and other Kentucky providers, to download and enjoy on an Apple™ device.

Strategic Partnerships

While KDE and Kentucky's schools and districts enjoy a cooperative relationship that many states do not, it would still be impossible to have accomplished all that we have without the ongoing assistance of our partners, who exist in business, industry, higher education, and government.

Because of the scope and difficulty of many of Kentucky's technology initiatives, it has been valuable to encourage vendors and other entities to view our relationship as a partnership rather than just contractual obligations. A little more effort on the front-end may be required in order to share the vision and excitement, but it has the benefit of increasing the ownership and trust, which in turn enhances collaboration, understanding and ultimately, the speed of completion and quality of end result.

Professional Development

A critical component of successful technology integration into instruction involves the professional development of our teachers and administrators so that student achievement can be realized. Kentucky has a long history of supporting professional development through collaborative models as evidenced by 76% of state-wide teacher participation according to "Professional Learning in the Learning Profession" (National Staff Development Council, 2009).

No situation can be enhanced or problem solved merely by implementing new software or hardware. KDE firmly believes it is the *people* that create value; technology can only facilitate value creation. Furthermore, professional development does not always translate to classroom training for our educators. There are many ways in which interactive learning is demonstrated to provide a range of options toward professional development.

The integration of technology into classrooms impacts not only the traditional classroom model but also the manner in which professional development occurs. Today's students have grown up with the technology that is appearing in their classrooms and are therefore positioned to perform on-the-spot knowledge transfer to their teachers where a computing device is involved. Now more than ever, students can play an active role in how they learn, while teachers maintain responsibility for the development of the curriculum itself.

Professional Learning Communities (PLCs) are an alternative method of providing instruction to Kentucky's teachers. Leveraging a PLC environment allows teachers to collaborate with their peers, taking ownership of their learning environment in much the same manner that students should be encouraged to do. As PLCs are currently being utilized for Common Core Standards, this format could also be leveraged for initiatives related to incorporating technology tools into the classroom.

The KETS focus is shifting from an intelligent classroom design that is based on fixed technology components to an interactive classroom design. This model both incorporates and exploits the capability of not only the technology itself but also the understanding of how it can support our state's 21st Century learning objectives.

KDE has historically supported and continues to enhance the growth of professional development by incorporating our next generation learners into the process. The Student Technology Leadership Program has been a successful contributor to this effort, as well as the use of Technology Resource Trainers. Our current partnership with Learning Forward is further illustration of Kentucky's commitment to ensuring the professional growth of our current and future leaders.

KETS Services Provided

Since its inception in 1992, KETS has been anchored by the principal of equity of access through a cooperative partnership between local district and state technology leadership. Ensuring statewide access for all students, teachers, administrators, schools, classrooms, and district offices to the myriad of instructional and administrative systems available requires a unique blend of enterprise services provided at the state level on behalf of all districts, at the local district level on behalf of all schools, and at the school level on behalf of all classrooms. This tiered delivery model is underpinned by enterprise standards and allows for economies of scale to be fully recognized to achieve the most efficient model of supportability.

Overview of Funding Models

The KETS Master Plan Budget outlines the total cost of technology ownership including initial purchase, recurring costs needed to support implementation, continuous improvements in technology, and the professional development of teachers. The four categories of products and services that are required annually to address K-12 education technology needs are operations, maintenance, incremental replacement, and implementation of new and emerging technologies. Within each of these categories, state and local resources - both human and financial - work together to ensure optimum efficiency and availability to all students, teachers, and staff. Operations and maintenance represent the technical effort necessary to sustain current levels of service to all devices and instructional and administrative systems. The area of incremental replacement constitutes a framework to upgrade various technology components on a scheduled basis over time and in accordance with the life cycle of each item or service. The implementation of new and emerging technologies represents the need to continue alignment of technology solutions with emerging trends and the needs of the instructional, administrative, and programmatic communities.

Technology is an important part of education today. It's providing teaching and learning tools and resources never before available. And it's providing collaborative and on-demand, anytime, anywhere teaching and learning. The idea is to figure out ways to incorporate new technology in teaching; help bridge gaps between what students know when they graduate from high school and what universities and employers expect them to know; and to shake up conventional teaching and classroom formats.

Dr. Terry Holliday, Kentucky Commissioner of Education

At the state level, KDE has partnered with industry leaders to provide services to and on behalf of all 174 public school districts. Centralizing the delivery of enterprise services not only affords the Commonwealth millions of dollars in savings on an annual basis by leveraging the buying power of the entire state, but also ensures highly efficient interoperability and ease of integration. Focused primarily on the delivery of services to each district, the state effort provides standardized and secure access to the Internet, electronic mail, financial management and student information systems, as well as access to instructional content such as Encyclomedia, iTunes U, and the entire digital learning environment. Additionally, programmatic offerings are also provided to all districts such as Help Desk Services, Federal and State Funding Assistance, Student Technology Leadership Program management (STLP), customer-facing technology leadership, and technology procurement vehicles (contracts).

At the local district level, technology leaders focus primarily on the extension of these services to each school and ultimately into each classroom, as well as the task of providing the necessary devices and access to every student, teacher, and staff member to facilitate the digital learning environment. Therefore, the procurement, implementation, and support of all computers, software, printers, file servers, school local area network (LAN) and wide area network (WAN) connectivity, telephone systems, intelligent classroom components, and cafeteria, library management, and transportation systems are examples of the technical effort required.

This collaborative partnership between local and state resources continues to make huge gains towards the objective of always on, anytime, anywhere learning. Moving important services to the cloud and partnering with world class vendors, combined with local efforts of 1:1 access and BYOD³ (Bring Your Own Device) have the Commonwealth closer to reaching this goal than ever before.

Equity and the Impact of Trends on KETS Funding Models

While many other trends within the education technology arena could be cited, those mentioned appear to be generating the most potential for transformative change within Kentucky's education environment and are therefore the focus of future technology direction.

The mobile device trend in particular is driving change within all levels of education. The benefit of leveraging existing technology within the classroom not only has the capability to change long term computer models in the near future (Lowendahl, 2011), but can also yield a positive impact on equity of access. As schools move forward with 1:1 initiatives, consideration should also be given toward the number of these devices that are already personally-owned. Doing so would reduce the overall cost of funding, allowing the focus to be placed on ensuring equity for those students that cannot afford a tablet or similar tool.

Accordingly, the traditional model for the accompanying KETS budget for Unmet Need has now incorporated a third funding source beyond state and local to include personal. This adjustment is intended not only to reflect this potential but also to encourage its use in districts prepared to support this model and curb the costs associated with equitable distribution of computing devices.

³ Further information contained within "Leveraging BYOD in the Classroom"

Bringing It All Together: Achieving Kentucky's Education Technology Goals

Kentucky's brand, "Unbridled Spirit", brings to mind a place where spirits are free to soar and big dreams can be fulfilled. Where competition is relished and champions are cherished for their willingness to push beyond conventional boundaries to reach new heights of success.

Modeling the Commonwealth's brand, KDE has established its own trademark of "Unbridled Learning" which is intended to foster proficiency and preparedness for success by ensuring that every Kentucky student graduates ready for college or career. Not only does KDE strive to guarantee that our students can become competitive adults on a national and global level, but also that all future job opportunities within the Commonwealth requiring the minimum education level of a high school diploma are secured by Kentucky's graduates.

Unbridled Learning represents not only KDE's strategy but also this competitive spirit in the form of associated grants and applications at the national level to enhance all available funding opportunities available to Kentucky's education system.

Kentucky Department of Education

KDE has in place specific strategies and associated action plans within the Unbridled Learning umbrella that are in direct alignment with the National Education Technology Plan's theme of Learning Powered by Technology. Representatives from all offices are engaged in some capacity with meeting the deliverables contained within each strategy that are required to ensure all Kentucky students are college and career ready. All related technology-enabled business projects are aligned to these strategies within KDE's enterprise project management system in order to track the success of these implementations upon the overall business plan.

Focus on 21st Century Skills

KDE's focus on the continued development of its strategic plan is to ensure that the ultimate goal of "college and career readiness" incorporates the critical skills associated with 21st Century Learning. This concept is addressed within the National Education Technology Plan as well as many other national alliances such as the Partnership for 21st Century Learning and ISTE's National Education Technology Standards (NETS).

Because technology has become so ingrained in our society, even the essential skills that have historically been considered "blue collar" are requiring the inclusion of basic awareness of computing within factories, shippers, and similar industries. For example, agriculture, still a predominant factor in Kentucky's economy (Kentucky Secretary of State, 2011), incorporates GPS and other technologies into farming equipment.

Through active involvement as previously outlined, Kentucky's educational leadership not only recognizes the need to infuse the essential components of national strategies and initiatives into its own plans, but also strives to serve as a national model for education technology best practices by ensuring that every child is proficient and prepared for success, regardless of his/her chosen field. Accordingly, it

is not enough for Kentucky’s Next Generation Learners to be technology literate to succeed – they must be *fluent*. The model for Unbridled Learning depicted in Figure 2 aligns industry standards and best practices for education technology with KDE’s strategy and focus on advancing 21st Century skills for all Kentucky students. This model will continue to be enhanced as KDE progresses with its goals of making a positive impact within every classroom.

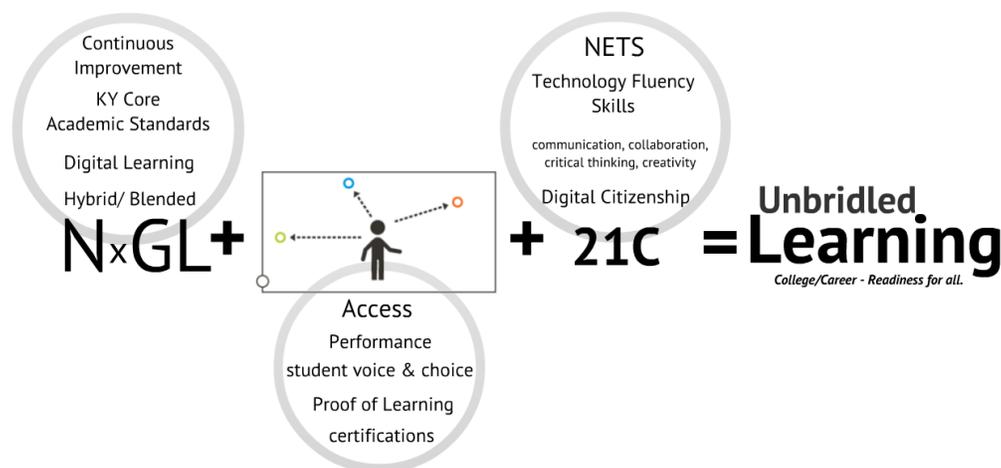


Figure 2
 This “equation” of Next Generation Learning (NxGL) + Student + 21st Century Learning (21C) results in KDE’s Strategic Plan.

Digital Access

In addition to the progressive work that Kentucky’s schools have made toward the industry trends surrounding ubiquitous access, KDE has also laid out plans to address the infrastructure to support the demand for ever-present and everywhere access.

The foundation of this planning was instituted as the Kentucky Education Network (KEN), which was implemented in the 2006-2007 and 2007-2008 school years. This project, funded by the Legislature, moved access to the Internet and shared services from a pedestrian 20th Century style to a 21st Century model, providing “high speed” access for all districts.

Concurrent with the implementation of KEN was the Instructional Device Upgrade Project. Also funded by the Legislature, this project provided \$50 Million in funding to address the need to replace an ever growing number of obsolete workstations and laptops that were being used within Kentucky’s classrooms. While the majority of the obsolete devices replaced were traditional desktop computers, advances in instructional devices and aggressive pricing from partners through their KETS contracts allowed for districts to maximize their purchasing power and deploy instructional devices that provided an increased level of access to technology for both students and teachers. This investment in student and teacher technology coupled with the investment in KEN sets the stage for an increased level of access to modern instructional content.

KEN has proven that students have a genuine thirst for knowledge with a 1300% increase in peak Internet usage (2005 Internet Peak 300 Mbps, 2011 Peak 4000 Mbps: KIDS 2012). This trend is expected to continue for the foreseeable future as BYOD and Cloud Computing continue to become common place throughout the state. However, it is unclear how much of this increasing demand for bandwidth will fall onto state resources vs. what will parents provide via a student owned device.

Regardless of the balance between the public and private funds for providing access to the Internet and state shared services, the overriding factor is that the demand is likely to outweigh the state contribution as well as the combined resources. With this in mind, KDE is planning for a more cost effective and flexible contract to address the give and take nature that will likely exist in the relationship between public and private access. In addition, the contract will need to allow for and encourage quick adaptation to new technologies which can lower cost and increase bandwidth capacity.

Using Data to Improve Instruction and Make Informed Decisions

Faced with the need to create a competitive workforce and to dramatically improve the quality of its education system, Kentucky has embraced an aggressive agenda for ensuring students are proficient and prepared for college and career. To gauge this effectiveness, Kentucky is laying the groundwork for having quality data available for research and analysis. It is important to identify and analyze successes to drive progress statewide.

KDE has historically collected large quantities of data, primarily for state and federal reporting. This data has typically been produced at an aggregate snapshot level. The current emphasis is to utilize data to improve instruction in support of the KBE Strategic Plan. To accomplish this goal, data must be analyzed at the student, classroom and program level. Kentucky's enterprise-level data systems provide a longitudinal view of student, teacher and classroom data along with school, district and financial-level information. In turn, this information is used for informed decision-making.

In conjunction with these efforts, the concept of Data Governance is actively in effect at both the state and local levels. Data Governance is intended to provide assurances in the quality of information, thereby supporting the goals of improved instruction and informed decision making. This effort is cyclical and includes the development and continuous improvement of an enterprise data dictionary, user role definition and ongoing evaluation, and the application of assurances to achieve data quality.

Data quality in particular is crucial to the accuracy and integrity of KDE's related information systems. Data quality can best be summarized and subsequently applied by incorporating five "C's" into all activities surrounding the use of data:

- The data must be **Complete**
- The data must have a **Common Definition**
- **Champions** of data quality must exist at all levels to ensure success
- **Communication** ensures awareness
- **Compare** data elements; you get what you inspect, not what you expect

While data has not historically been an IT initiative, organizations continue to realize the need to maintain quality information for analysis and research. The systems housing the data support the entire organization, which requires qualified technical resources to manage and support the systems themselves. Agency-wide collaboration is a key component toward improved data quality and enhanced decision making skills in support of the 21st Century learning environment.

Continuous Instructional Improvement

As outlined by KBE's Strategic Plan, every child deserves to be taught by an effective teacher in a school lead by an effective principal. In order to have positive impact on student learning, it is crucial that all teachers and leaders have, at their disposal, a wide variety of resources to ensure they are able to provide the highest quality learning environment for their students. It is the Commonwealth's vision that every Kentucky teacher will have a full set of digital learning tools available at his/her fingertips to enhance every student's experience. In the classrooms and schools of the 21st Century it is essential that the data and instructional resources used by teachers and leaders be available in an increasingly technology-based environment. It is with this in mind that Kentucky will focus a great deal of energy on expanding the use of technology in the instructional environment throughout the state.

To facilitate the integration of technology into the learning environment, KDE has dedicated significant effort into the creation of the Continuous Instructional Improvement Technology System (CIITS). As a teacher prepares for a lesson, through CIITS, he/she can access each student's data to identify which concepts need further exploration and attention in the classroom, access exemplary lesson/unit plans, and even view podcasts from master teachers or higher education faculty on key concepts across the standards. This online environment will allow educators to engage in dialogue about educational practice through social networking tools. Teacher use and application of CIITS in their daily classroom practice will become an important aspect of their ongoing professional learning.

Over the next several years, and as time and technology progress, KDE will continue to build CIITS, placing key information and resources at the fingertips of teachers, principals, and administrators. CIITS will support the instructional improvement efforts of teachers and leaders by allowing them unprecedented access to curriculum, instruction, assessment, professional learning, evaluation, and school improvement resources through a single integrated system. The system will link to already existing proven resources, such as Encyclomedia, the Kentucky Learning Depot, the Kentucky Virtual School and Virtual Library as well as include newly developed materials through Open House, KDE's data portal. Open House will provide access to a wide range of longitudinal data elements and reports that can be used to inform classroom practices and improve student learning.

Kentucky has a long history of working for equity within its schools and districts as it relates to effective technology resources to enhance the learning environment. Integrating all of these resources in a single system, as opposed to separate systems, is the foundation of a successful transition to a technology-enabled learning environment. Building an instructional improvement system upon a technology foundation will ensure quality resources for every teacher and leader anytime, anywhere.

...today's students have a very clear vision for how emerging technologies can enhance their learning and achievement levels. They have a sophisticated view that the real potential of the technologies we have today and those that will be invented tomorrow, is to transform their learning experiences and to create environments that are engaging and empowering. Quite simply, we are still not living up to their expectations yet.

Speak Up 2010 National Findings (Project Tomorrow, 2011)

Schools and Districts

Kentucky's schools continue to make rapid progress toward industry trends surrounding ubiquitous access and the attainment of classroom-level benefits. In conjunction with the recommendations and goals outlined within KBE's strategies and state-level leadership initiatives, the learning environment is in fact experiencing a process of transformation.

Leveraging the BYOD Concept in the Classroom

A key trend in accomplishing the ratio of 1:1 device access is implementing a Bring Your Own Device (BYOD) strategy. Within the national education arena, a stark contrast was drawn between parents and principals in Speak Up's 2010 findings. On average, 66% of parents were willing to purchase a mobile device for their K-12 students' use in school. However, 65% of principals were not willing to allow the devices through the school's doors. (Project Tomorrow, 2011)

The same year these survey results were published, Kentucky's schools were actively demonstrating willingness to accept the introduction of mobile devices into the learning environment. In 2011, approximately 58% of districts *allowed* students to bring personally owned mobile devices (laptops, tablets, and other handheld devices) to school. (Office of KIDS, 2012) This trend of acceptance and mitigation through modification of acceptable use policies demonstrates the potential to incorporate personally owned devices within Kentucky's education system. However, the percentages must continue to climb if these schools are to take full advantage of technology provided by parents and take the next step by integrating these devices into instruction.

Schools that have yet to embrace this change should soon be doing so in conjunction with the Digital Learning 2020 report which recommends the creation of a Student Access Taskforce that would utilize a phased plan to create policies for BYOD environments. (OpenEd Solutions) BYOD is a crucial component of the overall plan to shift Kentucky's instructional materials to an online model by 2013-2014.

While BYOD is a definite national trend within K-12, KDE recognizes this is not a one-size-fits-all initiative. Not all student-owned mobile devices are equipped with the unlimited data plans, as the owners may be primarily using public or private wireless access. Not all schools are equipped with the dense wireless required to enable these devices to access content via a local network in the secure manner necessary by law. This is where districts must leverage their own planning process to arrive at the appropriate strategy for the local level⁴.

Just as private sector organizations have had to alter thought processes and associated policy in recent years around the "disruptive innovation" that has been encountered through the evolution of smart

⁴ Further information contained within "Coordination of District Strategic Planning" section.

phones and slate devices, Kentucky's schools are encouraged to recognize the trends and leverage this technology in the classroom with thoughtful consideration to all related components such as enhanced network access and professional development. These components in particular are key elements of the successful mobile device integration into instruction. If the appropriate connectivity is not present, the devices themselves are little more than paperweights. Just as important, if the teachers themselves have not been appropriately prepared and understand the essential skills required to operate and manage these devices, they cannot possibly be leveraged appropriately for instruction. When BYOD is implemented in conjunction with these key components and the integral Digital Citizenship model, the cost savings of instructional devices can be balanced with teaching safety and responsibility of their use within a digital society.

Online and Blended Learning

In addition to the shift of instructional device models from laptops to smart phones and tablets, digital learning initiatives also include online and blended learning environments, allowing various delivery methods to be combined for effective teaching and learning.

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. (Project Tomorrow, 2011)

Within Kentucky's schools, however, there is still progress to be made. While in 2011, 68% of districts reported that Web 2.0 usage by teachers and staff is encouraged and/or supported, 59% of student access is encouraged and/or supported. The percentages related to usage continue to rise year to year while schools that strictly prohibit the use of Web 2.0 tools are in fact declining (Office of KIDS, 2012), a movement that will have a positive impact on the Next Generation Learners' experience.

The professionals within Kentucky's schools should continue to explore all avenues of incorporating online and blended learning concepts to not only engage students but also to provide them with a sense of personal ownership of their education. This does turn the traditional classroom model on its proverbial head but is necessary to develop the 21st Century skills that will meet the demands of the global workforce.

Coordination of District Strategic Technology Planning

Through the legislation associated with the development and maintenance of a Master Plan, districts are required to develop a Strategic Technology Plan that spans at least one but no more than three years. Components of a district strategic technology plan include establishing specific goals related to the following categories.

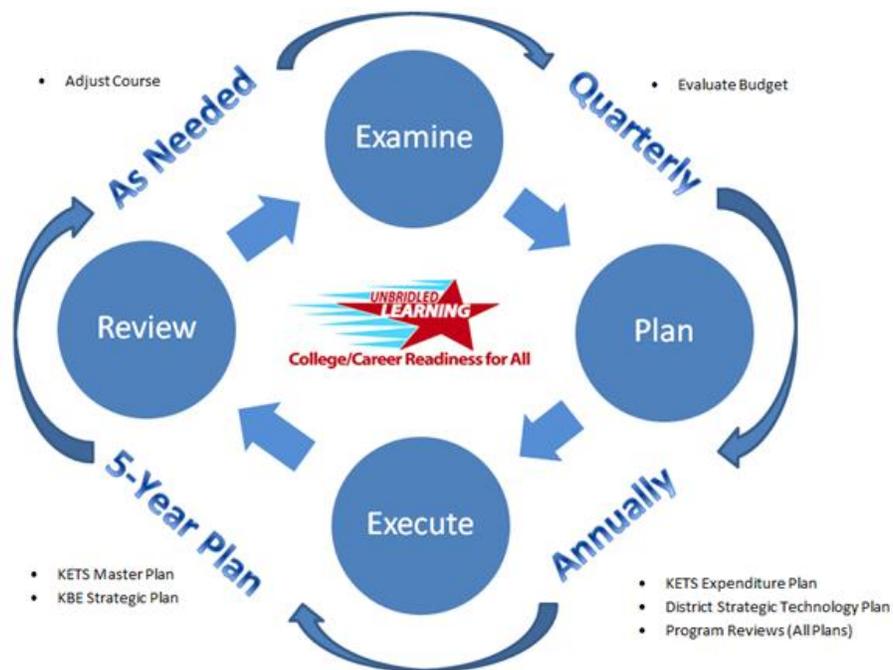
- **Curriculum & Instructional Integration** – Identification of curriculum and instructional strategies that promote effective integration of technology into classroom instruction, leading to improved student academic achievement.

- **Student Technology Literacy** - Clear goals and specific implementation plans detailing how technology will be integrated into curriculum and daily instructional practice.
- **Professional Development** - Strategy for administrators and teachers to ensure awareness regarding the usage of new and existing technologies to improve education.
- **Technology** – Planned initiatives to meet the goals of the district through the identification of technology solutions that are designed to provide ongoing support to the educational environment, both academically and administratively.
- **Program Review** – An evaluation process is required to be incorporated in the plan to enable the district to monitor progress toward the specified goals and make mid-course corrections in response to new developments or opportunities as they arise.

As with the Master Plan itself, the identification of funding sources is also a critical component of the district strategic technology planning process. These plans must include a budget that describes all available resources at the federal, state and local levels. KETS is a state level funding source for district plans.

Strategic Technology Plans at the district level fit into KDE’s overall strategic planning cycle, depicted in Figure 3 below. There are well-defined and repeatable processes within all levels of the department occur during specified timeframes. As this planning cycle continues, KDE strives to align all strategies and associated goals to ensure that careful consideration is made at both the state and local levels toward continued improvement of Kentucky’s education system.

Figure 3
KDE Strategic Planning Cycle



An important focus for the Master Plan is to identify leadership and support opportunities directly tied to goals and deliverables for the KDE and for School Districts. When doing so, targeting measurable indicators presents the opportunity to gauge the overall efficiencies and effectiveness of the KETS program. Like the Master Plan, the District Technology Strategic Planning process is intended to provide the local level with control over the decisions related to integrating technology into instruction and school business and efficiency based upon the situation and capabilities such as culture, policy, and available funding sources. Just as the National Education Technology Plan cannot dictate standards and specific requirements for all 50 states, the Master Plan itself cannot define a step by step process to follow, nor can it advocate one solution over another for 174 districts.

The Master Plan can also be considered a guide for districts to reference and consider when developing their own strategies for technology integration. The goals and performance of KETS (which in turn support the strategic goals of the Kentucky Board of Education) can be measured through the technology strategic planning process.

In Summary

Without a doubt, technology plays an integral role in preparing Kentucky's children with the skills necessary to enter successfully into college as well as the 21st Century workforce. Technology itself never has been and never will be the sole solution to enhancing the educational environment. Successful integration of technology into learning requires thoughtful planning, preparation, and collaboration of all technology professionals, teachers, and administrators.

Providing the capability for every student and educator to access information anytime, anywhere, and from any device requires focus to be placed on availability at both the state and local levels. For example, the Commonwealth level responsibilities are to ensure the KEN is always on while the district focuses on its local connectivity links. The Commonwealth should provide guidance on best-practice deployment of tablet devices while the district determines the device model and whether to implement a pure 1:1 initiative (fully funded), BYOD, or a hybrid of the two. Perhaps a district determines through its technology strategic planning process that the focus needs to be on interactive classroom design and associated professional development requirements. Regardless of the local decisions, the underlying goal is to ensure that every Kentucky student is proficient and prepared for success.

The content itself and the methods of delivery, including the device used, will continue to evolve but the essential need for stable, reliable, and secure access requirements for every student and teacher will always exist. The classroom model of the 21st Century, incorporating collaboration, communication, critical thinking, and creativity, will become further established with Kentucky's schools when appropriate planning and associated action is taken by all involved.

If, as a reader of this document, you are still not convinced that technology plays a pivotal role within education, attend an STLP event and ask the students themselves. If you are not convinced that a 1:1 initiative can make an impact, speak with the Kentucky high school students that carry tablets instead of textbooks. Take a moment to absorb the level of excitement and passion that they have not only in

using these tools in the classroom and beyond, but also in taking ownership of their learning experiences, wherever they may be. The learning experience **should** be exciting and engaging, so if the Commonwealth's teachers and administrators can harness this spirit, true Unbridled Learning will be realized and Kentucky's children will continue to win the big races, nationally.

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