KETS Master Plan

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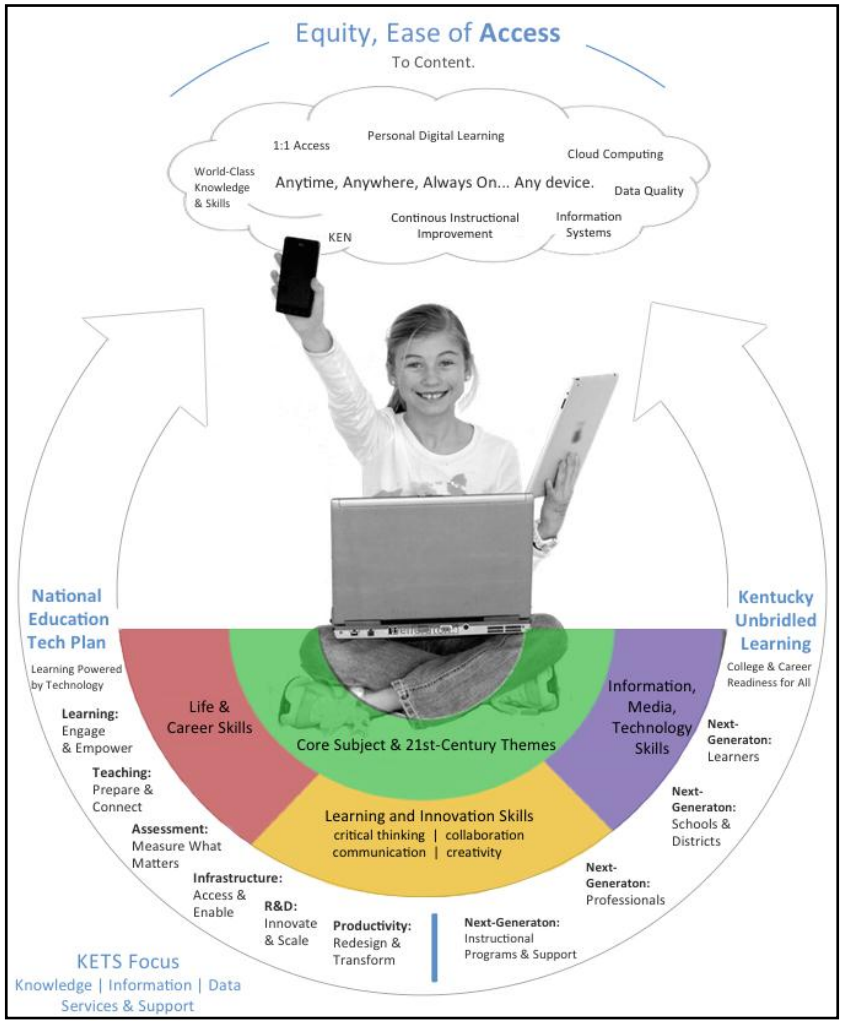


Kentucky Education Technology System (KETS)

Terry Holliday, Ph.D., Commissioner
Kentucky Department of Education

For more information contact: *Office of Knowledge, Information and Data Services*
15 Fountain Place
Frankfort, KY 40601
(502) 564-2020

Table of Contents

Introduction 1

The Vision: Unbridled Learning 3

The Strategic Plan 4

Technology Component: Measurement, Analysis and Knowledge 6

National and State Plans 9

Studies and Research 34

Supporting Guidance 46

Unmet Need Budget 49

Product and Technical Standards 50

Introduction

As mandated by KRS 156.670, a plan related to purchasing, developing and using technology to accomplish specific purposes in Kentucky's public school systems must be developed and must cover at least a five-year period. This is the fourth Kentucky Education Technology System (KETS) Master Plan for Education Technology. The previous three versions served this state very well and are the foundation to build the current Master Plan.

To develop this plan, staff at the Kentucky Department of Education (KDE) gathered feedback and input from the state's 174 school districts. The KETS Master Plan 2013-2018 builds upon the state's past successes and progress. This plan illustrates the path that will enable all students, teachers and administrators to become capable of understanding and leveraging technology. Education technology can provide students and teachers with the opportunity to realize their full potential. It extends instructional content beyond traditional school walls and leads students to where every opportunity is open to them.

This Master Plan includes information about technology unmet need for schools, districts and the state; education technology-related products and standards; and the policies and laws that affect education technology.

While the technology has changed over the years, the primary purpose of ensuring technology tools enhance the learning experience of students and help get them prepared for higher education and competitive in the workforce has not changed. Equity of access and opportunity has its roots in the Kentucky Education Reform Act (KERA) of 1990 and will continue to be a cornerstone and driving force principle. Providing the following through technology-enabled tools also will continue to be major drivers throughout everything we do:

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

The 2013-2018 KETS Master Plan addresses the technology unmet need for schools, districts and the state. This portion of the plan addresses both the ongoing operational, maintenance and replacement needs as well as the technology-enabled aspects of new strategic educational priorities, plans and projects. A variety of federal, state, local and personal funding sources are used to address that unmet need and are identified in the budget.

The 2013-2018 KETS Master Plan differs from previous versions in three main ways:

- This plan is more closely aligned with the P-12 education strategic plan of the state and districts. The Kentucky Department of Education and Kentucky Board of Education strategic plan components are imbedded throughout the Master Plan, and technology-enabled products and services are used to help address specific parts in those plans. The Master Plan contains a carefully planned vision, formed by overarching ideas, each comprised of clear initiatives that are intended to improve teaching, learning, efficiency, statewide collaboration and transparency to parents and the community.

- The plan is informed by relevant studies, research results, audit results, survey results, customer feedback and national, state and district plans to help guide and influence the direction of the work going forward. The plan highlights key text or graphics from those materials and provides links to source documents.

- Unlike previous versions, this Master Plan is intended to be read and used online versus in printed form. This plan will be much more dynamic in nature and therefore requires an electronic form rather than a pure static paper document.

The Vision: Unbridled Learning

Every child proficient and prepared for success via a personalized system of education that prepares each child for life, work and citizenship in the 21st century.

Click for more about Unbridled Learning
(http://education.ky.gov/comm/UL/Pages/default.aspx)

With the passage of Senate Bill 1 in the 2009 session of the Kentucky General Assembly, the Commonwealth of Kentucky was charged with addressing several critical areas of need within the P-20 environment. The resulting initiatives have been branded as Unbridled Learning and present a clear path to proficiency for Kentucky.

Key Concepts Are:

- focus on college and career readiness
- revised standards in English/language arts, mathematics, science and social studies
- new assessments
- new Program Reviews
- new accountability system

The Strategic Plan

This effort is organized by Strategic Priorities, Objectives and Goals. How we achieve each of these goals is defined by a unique Delivery Plan, which will include various projects, or strategies.

The Five Strategic Priorities Are:
Next-Generation Learners
Next-Generation Professionals
Next-Generation Schools and Districts
Next-Generation Support Systems
Next-Generation Operations

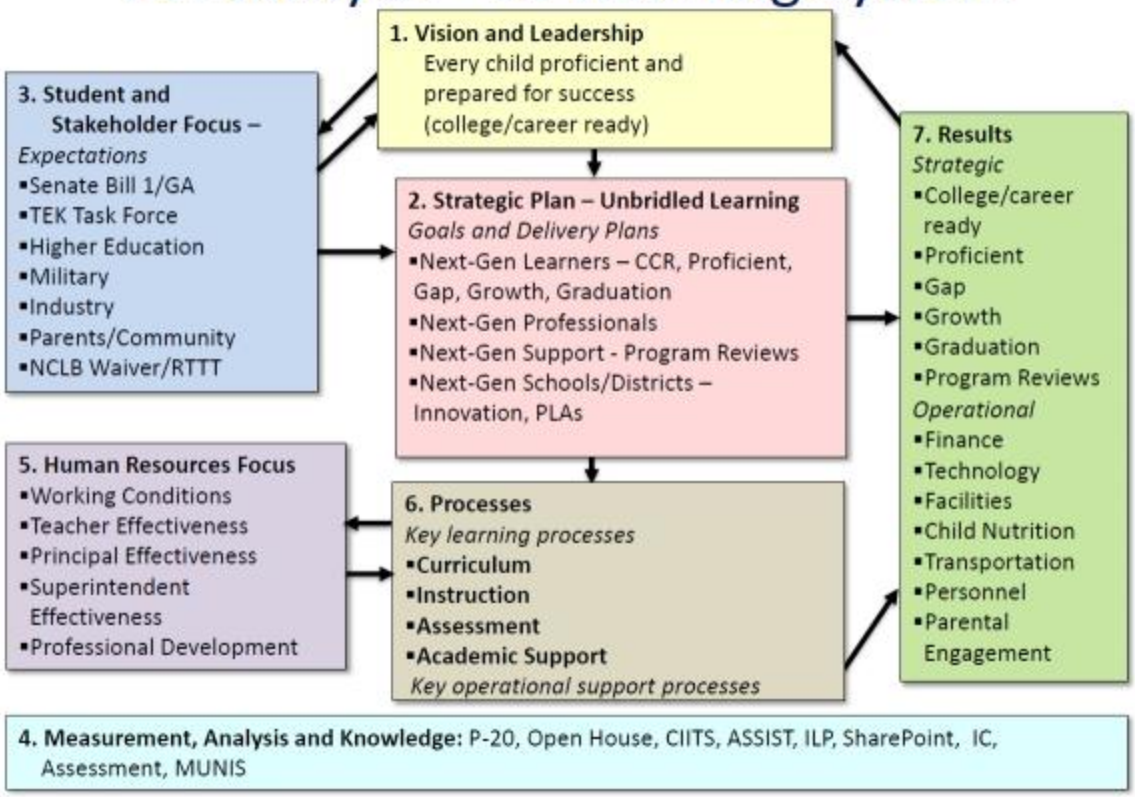
The following table provides links to more information about the plans. Status reports on the implementation of projects related to each plan also will be here.

Delivery Plans
College and Career Readiness (http://education.ky.gov/districts/tech/kmp/Documents/ccrdeliveryplan.pdf)
Gap (http://education.ky.gov/districts/tech/kmp/documents/gapdeliveryplan010312.pdf)
Proficiency (http://education.ky.gov/districts/tech/kmp/Documents/ProficiencyDeliveryPlan.pdf)
Next-Generation Professionals (Please note that this plan is still under development.)

Click for more about the Strategic Plan.
(http://education.ky.gov/KBE/plans/Documents/CTP10610KBEStrategicPlan.pdf)

The graphic on the next page illustrates how all of these efforts are assembled within the educational environment.

Kentucky's P-12 Learning System



Technology Component: Measurement, Analysis and Knowledge

Key processes are a critical component of the P-12 learning system. Within KDE, these key processes encompass human resources, facilities and legal/regulatory considerations, to name a few.

As outlined within key processes, technology plays an integral role in the KBE's strategic plan by supporting information and knowledge components designed to ensure all Kentucky children are proficient and prepared for success.

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. 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.

Information from Kentucky's enterprise-level data systems are used for informed decision-making. Key enterprise-level strategies, or projects, that are fully integrated into the KBE's strategy include the following, while the diagram underneath depicts the complete view. These strategies fall within the Operational priority.

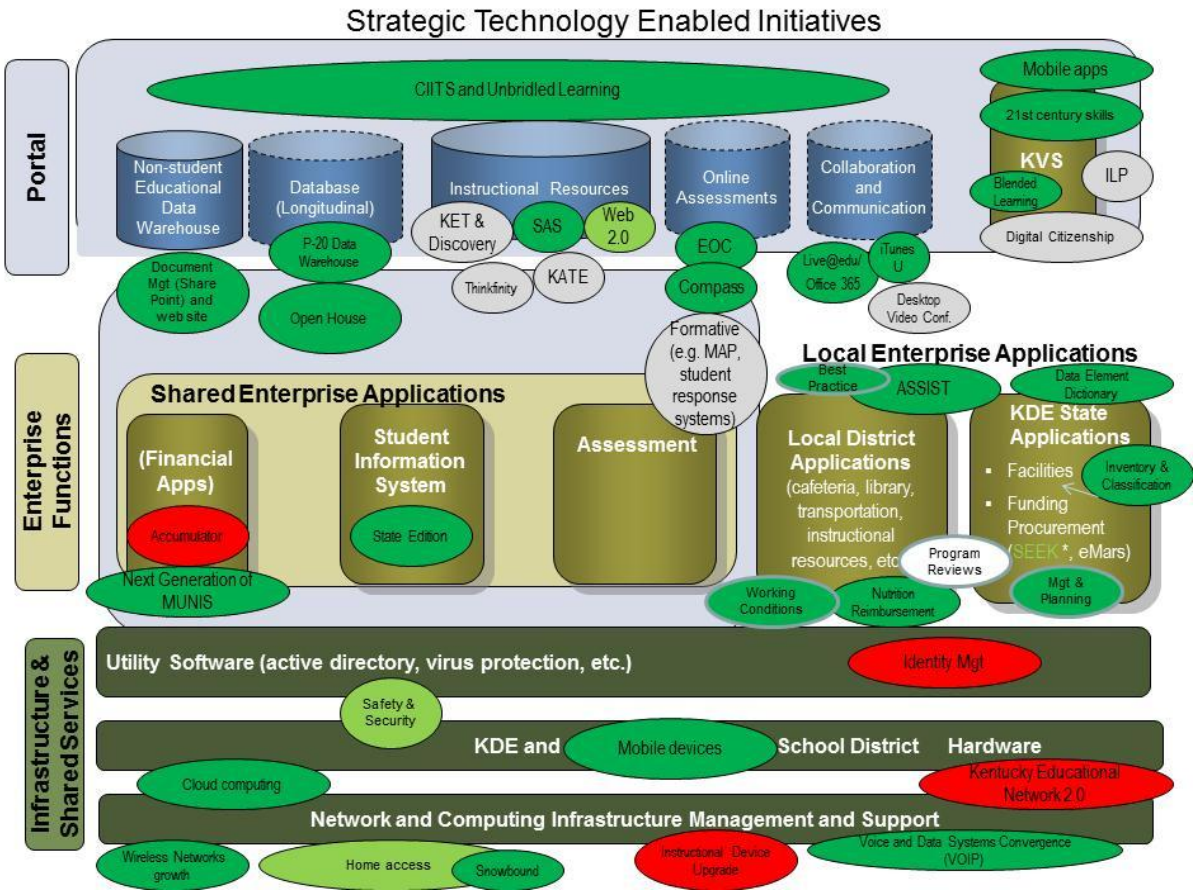
Enterprise Strategies/Projects
• **Identify and Maximize Data**
• **MUNIS Migration to Cloud** (http://education.ky.gov/districts/tech/kmp/Documents/MUNISInfrastructureMigration.pdf)

• **Access**
  ○ **KIH Next-Generation** (http://education.ky.gov/districts/tech/kmp/Documents/KIHNextGeneration.pdf)
  ○ **Award Contracts for Data and Voice** (http://education.ky.gov/districts/tech/kmp/Documents/AwardContractsforDataandVoice.pdf)

• **P-20 Data Warehouse** (http://kentuckyp20.ky.gov/about.aspx)
• **KETS KDE Collaborative Platform (Office 365)** (http://education.ky.gov/districts/tech/kmp/Documents/KETSKDECollaborativePlatformExpansion.pdf)
• **CIITS** (http://education.ky.gov/districts/tech/kmp/Documents/CIITS.pdf)
• **Student Technology Fluency**

• **Other**
  ○ e-Transcripts (http://education.ky.gov/districts/tech/kmp/Documents/eTranscript_Product_Sheet.pdf
  ○ Mobile Apps (http://education.ky.gov/districts/tech/kmp/Documents/MobileAppProgramOverviewandVision.pdf

- SharePoint (http://education.ky.gov/districts/tech/kmp/Documents/SharePointOptimizationProgramOverview.pdf)
- School Nutrition Reimbursement System Upgrade (http://education.ky.gov/districts/tech/kmp/Documents/NutritionProgramOnline.pdf)
- iTunes U (http://education.ky.gov/districts/tech/Pages/iTunes-U---A-Kentucky-Next-Generation-Learning-Project.aspx)
- Online Testing



Where We've Been, Where We're Going (click to see)

(http://education.ky.gov/districts/tech/kmp/Documents/KETS%20From%20the%20Beginning%20-%20Making%20A%20Difference.pdf)

This document, originating from the Office of KIDS, supplements the Master Plan by highlighting its history and importance to enhancing education technology within the Commonwealth, explaining the manner in which KETS supports the overall mission of the KBE. As the Kentucky Department of Education promotes the continued integration of technology into the classroom, current and emerging trends such as 1:1 and Bring Your Own Device (BYOD) are evaluated. The importance of incorporating the human element serves as a reference for

districts to ensure the right people are in the right positions and receive the appropriate development to the most effective and efficient use of technology within the learning environment.

In addition to the many recent studies referenced within this Master Plan, Kentucky's leadership is also demonstrated at the national level through active participation in various professional communities and continually evolving strategic partnerships. The focus areas to support a 21st-century learning environment at the department, district and school levels are also summarized. *KETS: An Analysis* provides valuable information for anyone wishing to further understand the various ways in which technology can support learning.

District Technology Goals

District Comprehensive Planning

Kentucky's school districts perform comprehensive planning activities to determine long-range goals for each school. The process encompasses identification of strengths and weaknesses with each school and developing strategies to leverage the strengths and mitigate weaknesses. The coordination of applicable funding sources to support activities and strategies is a key component of this initiative.

Click for more on Comprehensive Planning.
(http://education.ky.gov/school/csip/Pages/default.aspx)

Technology Planning Requirements

Through the legislation associated with the development and maintenance of a Master Plan, districts are required to develop Strategic Technology Plans that span 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
- Student Technology Literacy
- Professional Development
- Technology Goals Evaluation
-

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. The Master Plan also can be considered a guide for districts to reference and consider when developing their own strategies for technology integration.

The Office of KIDS provides districts with a District Budget Planning Tool and Technology Plan Template for completing their District Technology Plans. These templates ensure that points are covered to meet all federal funding questions. The Office of KIDS also works with districts to provide accurate commodity codes to assist with budgeting. Both documents may be found by clicking here (http://education.ky.gov/districts/tech/kfun/Pages/Funding.aspx).

Click for more on Technology Planning (http://education.ky.gov/districts/tech/kfun/Pages/Tech-Planning.aspx).

National and State Plans

Within recent years, several studies and initiatives at national and local levels have been conducted that are integral to education technology within the Commonwealth of Kentucky. Several studies yield recommendations that directly impact the strategic direction of KETS. This section contains a brief summary of each related connection with a link to the full publication. These connections collectively drive our efforts on a daily basis.

National Education Technology Plan (http://www.ed.gov/sites/default/files/netp2010.pdf)– The U.S. 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.

Kentucky is in sync with the five recommendations within the National Education Technology Plan:

1. Learning: Engage and Empower - All learners will have engaging and empowering learning experiences both in and out of school that prepare them to be active, creative, knowledgeable and ethical participants in our globally networked society.
2. Assessment: Measure What Matters – Our education system at all levels will leverage the power of technology to measure what matters and use assessment data for continuous improvement.
3. Teaching: Prepare And Connect - Professional educators will be supported individually and in teams by technology that connects them to data, content, resources, expertise and learning experiences that enable and inspire more effective teaching for all learners.
4. Infrastructure: Access and Enable - All students and educators will have access to a comprehensive infrastructure for learning when and where they need it.
5. Productivity: Redesign and Transform - Our education system at all levels will redesign processes and structures to take advantage of the power of technology to improve learning outcomes while making more efficient use of time, money and staff.

Digital Learning 2020
(http://education.ky.gov/school/Documents/Digital%20Learning%202020%20-%20A%20Policy%20Report.pdf)

In December 2011, OpenEd Solutions presented to the Kentucky Board of Education (KBE) a report titled *Digital Learning 2020*. It outlines **11 recommendations** related to various aspects of digital learning. 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 Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis.

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.
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.
3. Allow students to personalize their learning.
4. Support customized learning pilots.
5. Support competency-based learning pilots.
6. Plan for shift to online instructional materials by 2013-14.
7. Support the shift to blended instruction Assessment and Accountability (DLN 8, BNG 8).
8. Plan for online assessment by 2013-14.
9. Create a statewide online/blended learning authorizer/contractor.
10. Develop a fractional and performance-based funding model.
11. Create a program management office and fund the transition.

The report also outlined several strengths and weaknesses in Kentucky, and those can be seen in their entirety by clicking on the report link above.

Breaking New Ground (http://kytech.ky.gov/TEK_final_report_draft.pdf)

This report is the result of a 34-member task force, directed by Governor Beshear in 2009 to help develop new strategies to ensure Kentucky has the curriculum, teachers, standards, organization and structure in place to prepare children for the 21st century while reinvigorating public and business support for education in the Commonwealth. Of particular interest is Action Area 6: Better Use of Technology to Improve Teaching and Learning.

- Recommendation 6A:
  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.
- Recommendation 6B:
  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.

- Recommendation 6C:
  The KBE should develop/adopt state standards for quality of online and blended courses

- Recommendation 6D:
  The KBE should develop flexible policies that encourage innovation and allow students to meet course requirements through personalized, performance-based, anywhere/anytime learning.

- Recommendation 6E:
  Schools should use adaptive technology and universal design to improve learning for all students, including those with special needs.

KETS Master Plans (http://education.ky.gov/districts/tech/kmp/Pages/Past-MP.aspx)

Our previous KETS Master Plans provide a background and history of KETS that we continue to build upon. Many of the key concepts are still applicable going forward. This includes the relationship between strategic planning at all levels, a summary of trends in education technology, and the critical links between governance and the implementation of technology in Kentucky.

The 2013-2018 Master Plan is only the most recent of a number of plans developed by the Office of Knowledge, Information and Data Services for the Kentucky Education Technology System (KETS).

For a historical perspective of how far we've come, please see earlier versions (http://education.ky.gov/districts/tech/kmp/Pages/Past-MP.aspx) of the KETS Master Plan.

Where We Are Headed

Implementation of the projects and initiatives described in the Master Plan will deliver many benefits to teachers and students. These benefits will be incremental over time, collectively coming together to assist teachers and students to advance educational achievement.

The impact of the Master Plan will be demonstrated in developments and improvements such as:

- **Greater and more meaningful interaction between family, school and community**
  - Expand parental access to school, administration and teachers.
  - Remove time, place and distance barriers to teacher, student and parent communication.
  - Expand student access to instructional resources and tools outside the regular school hours and locations.

- **Improved student learning and preparedness for higher education, the military and the workforce**
    - Increase thinking and problem-solving skills by analyzing information with technology tools.
    - Address differentiated learning styles through the delivery of video, voice and written content.
    - Develop communication skills through writing, verbal interactions and the exchange of information with students at other sites.
    - Provide access to rich instructional content.
    - Develop basic skills and concepts through simulations and computer-assisted instruction.
    - Instructional content available to expand student research and information-processing skills.
    - Student awareness of a multi-cultural world view is enhanced through access and communication with students at other schools throughout the world.
    - Encourage respect of rights of others and ethical issues in using school technology assets.
- **Increased teacher productivity**
    - improved effectiveness and efficiency of instruction, curriculum development, school organization and operation
    - improved communication among teachers, parents, and students
    - computer-managed instructional delivery system
    - improved special education management
    - reduced teacher paperwork
    - encourage and support joint curriculum development and sharing
    - improved capacity to individualize instruction and to monitor assessment
- **Enhanced communications**
    - immediate availability of memos, letters, bulletins, reports and documents
    - improved communications between buildings, school districts, libraries and KDE
    - enhanced calendaring and scheduling to assist coordination of personnel, building and district resources
    - creation of "electronic communities" facilitated
- **Strategic decision-making**
    - Accuracy and timeliness of information is improved.
    - Costs are reduced and accuracy improved from centralized data.
    - Data collection becomes a by-product of daily processing activities.
    - Required reports are automatically generated from the database.
    - Data retrieval is simple and available in multiple formats, providing flexible access.
    - Data is maintained and stored electronically and printed only when required.
    - Required data can be reported electronically to state- or federal-level entities.
- **A robust infrastructure**
    - School buildings, educational centers, libraries and statewide education networks are interconnected.

- Stationary or mobile access to instructional tools is provided where appropriate.
- Access to video, voice and text instructional and administrative content is provided.
- Standards and protocols are provided.
- Current and timely information for decision-making is provided.
- Information sharing is quick and easy.

The Master Plan brings forth projects and initiatives that reflect common characteristics. Constituents such as teachers, students, district leaders and the business community identified the need for the following major areas of emphasis:

- Anytime, Anywhere, Always-On, Differentiated Teaching and Learning
- Capacity Building and Enhancement of Staff and Resources
- Data-Driven Decision-Making for Teachers and Administrators
- Efficiency and Governance

- **Anytime, Anywhere, Always-On, Differentiated Teaching and Learning**
  One of the most significant advances in education during the past few years has been the concept of anytime, anywhere, always-on learning. This concept is revolutionary, fundamentally changing the way students, teachers, parents and administrators interact with the state's educational program.

  The main premise of anytime, anywhere, always-on learning is that learning is not confined to the classroom and can continue regardless of the time of day, the physical location of the students, teachers, staff or the subject matter being studied. This flexibility creates a "child-centered" learning experience. Students can access course material and independent research or take distance-learning courses if a particular subject is not available at their local schools. Teachers can access grading and attendance systems outside of the classroom and prepare lessons remotely. Parents can view their children's homework, schedules and grades using the Internet. All parties can communicate effortlessly using education technology such as e-mail.

  It is this concept that fundamentally changes the education experience by aligning it to that of highly productive organizations such as business or the military. In short, anytime, anywhere, always-on learning allows educators to be extremely productive and effective in helping students reach their true potential.

  However, the concept requires a solid educational technology platform. In order for the students, teachers, parents and administrators to participate fully, they must have access to the proper educational technology tools. The educational technology infrastructure within Kentucky must be robust and contain certain educational technology components.

  - **Instructional Device or Workstation**

The most visible component of the education technology program is a student instructional device or workstation. It can be a desktop computer, a laptop computer or some type of mobile learning device.

Districts are encouraged to pursue lower workstation-to-student ratios. Lower ratios provide ease of access to all parts of the curriculum in the classroom and at home. The ideal standard includes one workstation for every secondary student and one workstation for every three elementary students. However, this is a very challenging target, given the costs of purchasing, sustaining and maintaining such a large number of workstations. Most districts choosing to pursue this goal will utilize different strategies and approaches. Some districts may choose to include personally-owned devices as an option to lower the workstation-to-student or -teacher ratio. This becomes more attractive and feasible as the devices get smaller, more powerful and less expensive.

- **Mobile Workstations and Wireless Connectivity**
  In addition to the ideal of a 1:1 student-to-workstation ratio, Kentucky's goal is to have mobile workstations connected wirelessly to the Internet with high-speed connections. A wireless foundation will allow students to utilize their laptops and other mobile devices to continue their studies, free of the constraints of time and place. Students would have continuous access to not only their documents and course materials, but could easily transport that material back and forth from the classroom to their homes. It is expected that mobile learning devices that use electronic text will eventually replace textbooks, placing even more importance on a wireless environment.

- **Equity**
  The movement toward a 1:1 workstation ratio combined with the proliferation of wireless connectivity goes a long way toward supporting the concept of anytime, anywhere, always-on learning. However, as educational technology changes the way that students learn, we must ensure that the same educational technology does not bring disadvantages to certain student populations. Parity must be a high-priority consideration. If certain students are able to access course material from home today using a family computer while others cannot, parity no longer exists. Computer and Internet access within public schools must figure prominently in the state's attempt to protect its young people from being held back because of the "digital divide." In fact, it is becoming generally accepted that access to information technology directly supports economic success.

  While parity has always been difficult to attain, it was more easily addressed in an environment where all students use textbooks. All students can be given books that they access all of the time. While parity should not be used as an excuse to stop investing in educational technology, those investments should be

distributed in such a way that will assist those who are less fortunate. One idea has been to create a content delivery fund, which would eventually cover the purchase of laptops, tablets, or e-readers for all students rather than funding the textbooks themselves. The text would then be electronically delivered to the devices at a far lower cost than printing new textbooks. This is an effective way to address some of the current challenges we face while trying to achieve a 1:1 workstation to student ratio.

- **Innovative Devices**
  The marketplace is full of wireless products, such as cell phones, portable media players and other innovative devices. Students, in particular, have embraced these products. Some students have shown an interest in using mobile devices, for example, to access lectures and other course materials. The educational leadership within Kentucky believes that these tools can become valuable for students in a monitored environment. Personal devices are a classroom management issue, and KDE recognizes that these devices continue to make their way into schools at an increasing rate.

- **Intelligent Classroom Design**
  Schools that pursue "intelligent classroom" design with electronic boards and projectors, mobile devices, wireless access and a low workstation-to-student ratio shall consider the following from a facilities perspective:
  - Even in a wireless environment, there may still be a need for wire in the classroom. For example, projectors, electronic boards, classroom printers and telephones are traditionally connected via wire. A wire usually connects the wireless access hubs to the local area network.
  - It is very possible that schools will need to significantly increase their power capacity to handle the new technology. Administrators of new schools should assume that they will move to this environment during the life of the school.
  - The number of wireless access points required for student workstations will depend on the school architecture. Some schools may need as many as one access point per classroom.
  - The physical space required for classrooms and other instructional areas will be determined by whether the school implements a laptop or mobile device approach and how aggressively the school pursues a lower workstation-to-student ratio.
  - Strong consideration should be given to using servers to cache and distribute video to classrooms for more efficient use of network resources. Fully implementing a KET EncycloMedia type of technology adds the benefits of indexing and ease of access by students and teachers.

- An expected steep growth in the use of wireless personal communication devices over the next decade will probably require a policy change that allows these devices to be used in school. Teachers and students may begin to use these devices for educational activities as well as for voice communications. Voice communications over the network (Voice over IP) is also expected to have a great impact on district communications.
- An electronic board/projector can substitute for a television in the classroom.
- Schools and teachers will want to consider including handheld voting devices as part of their electronic board and projector purchases.
- An improvement in the maturity of voice recognition software will lead schools to examine classroom layout and design for improved sound management. It will become more common for students to interact with their instructional device using voice commands rather than typing.
- The Internet and desktop conferencing will cause classrooms to move toward more advanced sound systems. The quality of their educational experiences will be enhanced with capabilities beyond that of a speakerphone.

- **Capacity Building: Enhancement of Staff and Resources**

  - **Maintenance and Support**
    Beginning in 1992, when previous versions of the Master Plan focused on increasing the number of workstations and building the technology infrastructure, students benefited greatly. Program funding was largely devoted to the initial purchase of technology components, the hardware and systems were new, and the ongoing maintenance costs were relatively low. However, over the past few years, funding for education technology has decreased, the infrastructure has aged significantly, and costs for maintenance and upkeep have increased.

    The usefulness of the educational technology infrastructure decreases when it is not kept up-to-date. When funding decreases, schools choose to continue using outdated equipment, following a “something is better than nothing” approach. Inventories indicate the number of workstations remains high, but the figures are misleading. Old workstations are often incapable of running modern applications or providing students with acceptable access to current instructional resources. What is truly important is that the students have access to modern and useable educational technology.

    When making significant new investments in technology, total cost of ownership including support, maintenance and replacement costs must be considered in addition to initial purchase costs. For example, the total cost to purchase a workstation must include the cost of the workstation; the cost to license the

software it runs; the cost for the technicians who are on stand-by to fix problems; and the expected cost of replacing the workstation in five years when it is obsolete. Schools and districts will only derive the full benefit of the workstations when these costs are planned for and managed.

- **The People**
  Skilled and talented technical staff are required to operate, maintain and plan for technology in schools. In many Kentucky communities, schools have the most advanced and sophisticated technology in the area. The success of new and existing education initiatives will require adequate numbers of properly trained people to operate and maintain them long after they are implemented. Multiple in-house or outsourced technicians are required to sustain state and district-level hardware and services for schools.

  School-based support includes installation and configuration of workstations and applications; operation, repair and maintenance of workstations and servers; and troubleshooting and security. These tasks are only a few of the ones that local support staff focus on every day. Their dedication and work ethic enable teachers and students to access the educational technology that is an essential component of their education.

- **Technical Resource Teachers (TRT) and Technology Integration Specialists (TIS)**
  The TRT and TIS work with teachers, administrators, staff and students to enhance instruction through the use of technology in the classroom. The TRT and TIS train teachers to use technology and electronic software effectively, through in-class instruction and hands-on exercises. Their understanding of the curriculum allows them to collaborate effectively with teachers and support them in their educational goals of student proficiency.

  The TRT and TIS also are capable of assisting with concepts such as classroom management of educational technology, participation in the selection of educational software and assisting students with technology-related activities or projects.

  There is an important distinction between technical support staff and TRT or TIS. Technical support staff possess technical skills and certifications but are not necessarily familiar with curriculum or instruction. TRT and TIS staff provide leadership and vision in the use of technology to support the learning and education process.

The recommended number of staff to support and operate various technology components must be determined on a district-by-district basis.

The one-on-one and small-group nature of the TRT and TIS programs makes them core components of a high-quality professional development program. However, they must be augmented due to the high cost. It is just too expensive to use at the exclusion of other professional development experiences.

- **KETS Engineers**
  KETS Engineers are the field-based technology leaders of the Office of KIDS. They serve as the primary points of contact for customer relationship and resource management for all school districts as well as KDE. They support the instructional, administrative and planning efforts of school districts through direct, face-to-face work with district leadership and district technical staff. They provide invaluable benefits, and their current mission and numbers should be maintained.

- **Office of Knowledge, Information and Data Services (KIDS)**
  Providing educational technology across an entire state is a complex undertaking. It requires leadership and a long-term vision that considers both improved teaching and learning through the appropriate use of technology, the efficient and cost-effective use of shared services, and improved statewide educational technology equity.

  The provision of shared services is based on the proven concept that combining need and leveraging that need will reduce costs and provide improved service levels. In addition to these benefits, the central delivery of these services reduces administrative costs over time. For instance, the total cost to the education technology program for the Help Desk would be about 10 to 15 times more if each district contracted for those services independently. In fact, some districts, because of their geographical locations, would simply not be able to find a responsive vendor, and the schools would lose the service entirely. The same can be said for engineering and instructional consulting services that are provided on a regional basis to the districts from the state level and for related services that may be provided from the district to the schools.

  KIDS brings its resources together with school and district educational technology providers to complement their hard work and determination with KIDS' educational technology vision.

- **Student Technology Leadership Program (STLP)**
  The mission of STLP is to advance individual student capabilities, to motivate participating students to learn and to create leadership opportunities using technology. STLP provides students with marketable technology skills and

experiences. It prepares them for the workforce as they address their schools' technology support needs and empowers students to use technology to learn and achieve.

Schools may choose to use STLP for some of their technology support, but a large amount of adult operations and maintenance talent is required to lead these services for the schools and districts.

- **Data-Driven Decision-Making for Teachers and Administrators**
  In the Master Plan, recognizing data as a strategic educational asset remains a top priority. As demonstrated in previous plans, KDE initially recognized this fact early in the life of the KETS program. The 1992 Master Plan called for a decision support system to assist the management and evaluation of the public education system in Kentucky. The Statewide Reporting and Information Management (SRIM) System, with an enterprise data model depicting the data collected and shared within the public education system, was constructed.

  Today, the demand for access to data to improve decision-making and instruction at the federal, state and local levels continues. The principles of data management in the P-12 educational environment, originally introduced in previous versions of the Master Plan, remain pertinent and applicable today.

  For emphasis and reiteration, these principles are intentionally repeated:
  - Data is a strategic enterprise asset and will be managed as such.
  - Enterprise-wide processes will be developed to move data collection and validation to the source and reduce duplication and redundancy.
  - Data will be moved and made available electronically.
  - Stewardship and ownership of the various data will be explicitly identified.
  - Data owners will establish procedures and processes that articulate the circumstances under which data will be collected, validated or purged.
  - Common data definitions will be established as standards.
  - KDE will differentiate data from "records" in the context of public records management. The department will review and update its procedures for managing public records in electronic format.
  - Data reporting to support compliance and assurance with state and federal program requirements will be consolidated.
  - Security and authentication policies will be associated with each aspect of the enterprise data model.
  - Privacy will be protected.
  - Policy-worthy information will be available for decision support.
  - The decision support needs of the Kentucky Board of Education and others will continue to be analyzed. Priority will be placed on supporting the information requirements of the board within the context of current board priorities.
  - Standards will be defined for data collection and end-user reporting tools.

- Data from disparate systems will be combined in a common repository or data warehouse.
- Those who provide data to the enterprise data management system will be able to use the data management system for their decision support needs.

  While the concept of a centralized data repository is essential to the enterprise data management system, it should be clear that the intention is not to collect all data into a single repository. Only the data that is essential will be held in the repository.

- **Efficiency and Governance**
  The Master Plan addresses the recommendations of stakeholders including teachers, principals, students, parents, business leaders and policymakers in the areas of efficiency and governance.
  - Teachers, students and administrators are hampered in their use of educational technology by older equipment and narrow bandwidth.
  - Schools and districts want to participate in key educational technology decisions. This participation will lead to optimal educational technology funding decisions and execution. KDE will utilize a collaborative and participatory style of governance.
  - With the size and number of new initiatives, a necessity for success will be coordination and collaboration between KDE program offices, school, district, state and vendors.
  - Educational technology service delivery must equitably address districts' varied service expectations and the lack of adequate funding.
  - P-12 education has multiple educational technology providers that define, support and implement educational technology initiatives. While they provide many valuable benefits, these groups should focus on developing a coordinated and collaborative approach.
  - School, district and state technology providers must provide a unified approach in the management and delivery of educational technology capabilities.

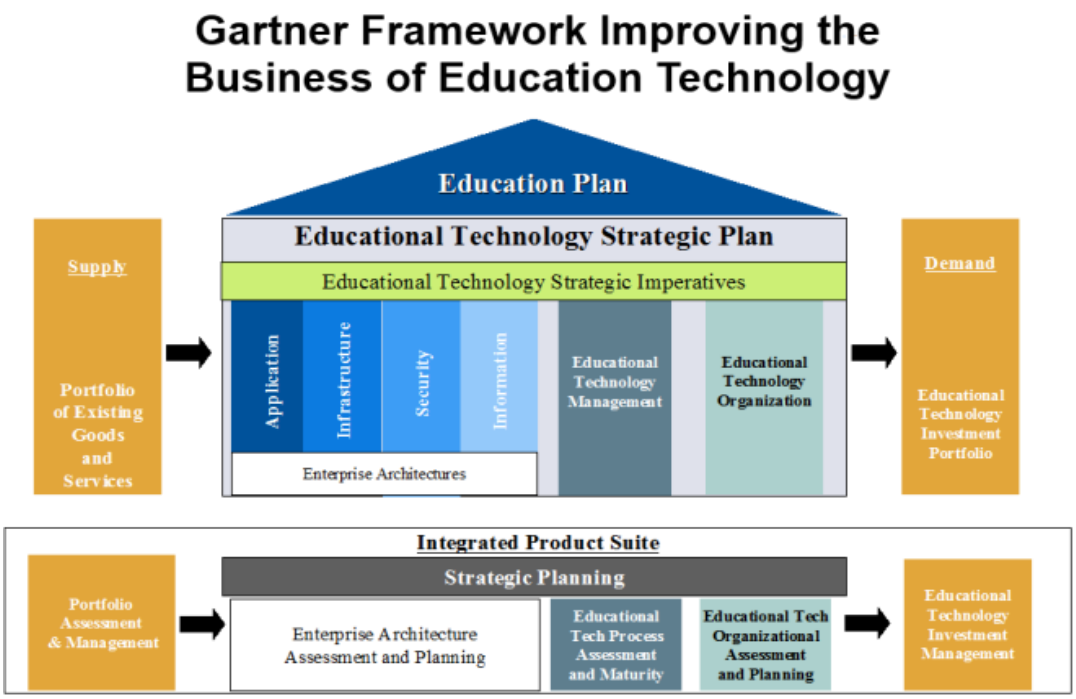
  The initiatives that have been included in this Master Plan address, in part, the following summary-level recommendations.
  - Review and revise the process to ensure effective representation in technology decision-making. Provide schools and districts with the opportunity to offer their input and to voice their needs conveniently and consistently.
  - Create a unified "voice of education technology" that enables the multiple educational technology providers across schools, districts and state agencies to better serve the students, teachers and educational staff throughout the state.
  - Establish a process to coordinate and collaborate on statewide core technology areas to enable strategic education initiatives. These areas include statewide enterprise applications, workstations/instructional devices, high-speed Internet

connectivity, learning and teaching programs, security, policies and change management.
  - Adopt and deploy a differentiated service delivery model by providing a core set of services tailored to groups of districts with similar characteristics. This will ensure that the educational technology services more closely align with district expectations.
  - Leverage all available funding options to upgrade obsolete educational technology and communications infrastructure

Technology Framework

The overall framework for technology assessment and strategic planning is shown below. The framework addresses both the supply and demand sides of managing technology resources using an education-focused approach:

- The education plan is the foundation, and it shapes the overall structure of the technology strategic plan.
- This master plan describes the technology strategic imperatives or those things that technology must do in order to enable education.
- The enterprise architecture is the vehicle through which many of the technology products and services are delivered, when combined with the available supply of technology goods and services.
- Technology management activities are the management processes used to shore up this entire foundation – they are used by the technology organization to provide the governance, skills and structure needed to enable the organization to deliver technology services effectively.
- Technology demand refers to the requests from the organization for technology services, and technology supply refers to the people, technology and financial resources available to satisfy that demand.
- The approach to strategic technology planning crosses all these areas.

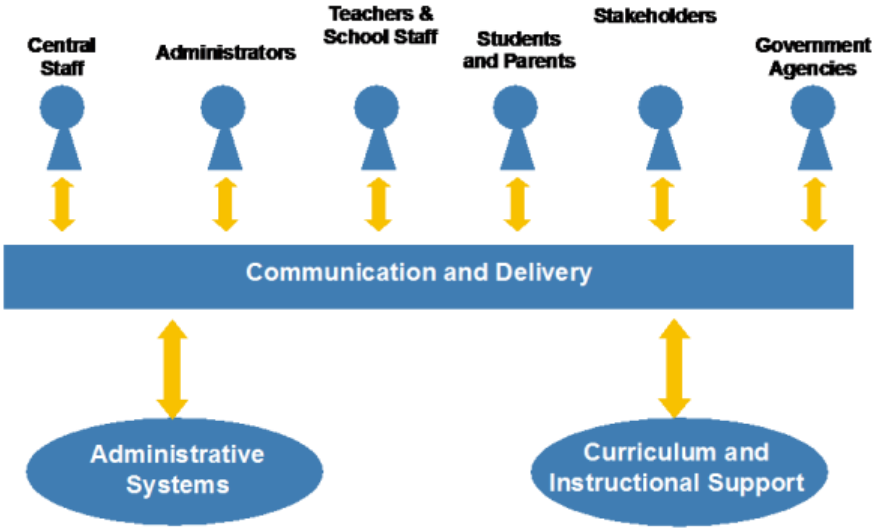


KETS Perspective on Education Technology

KETS uses the K-12 Technology Framework to describe a best practice approach to understanding and deploying technology to support the P-12 environment. Within this framework, departments of technology focus on three areas – administrative systems, curriculum and instructional support systems and communications and delivery capabilities.

- The administrative systems are the business and administrative functions, such as the student information systems and integrated financial and human resources systems.
- Communication and delivery capabilities focus on the infrastructure elements that enable the technology – telephony and video, maintenance, Help Desk, local and wide area networks, desktop solutions and more.
- Curriculum and instructional support are at the core of the mission of the school district. They support instruction and curriculum areas and include technologies that support shared academic standards, curriculum alignment, lesson plans, grade books, test creation and history.

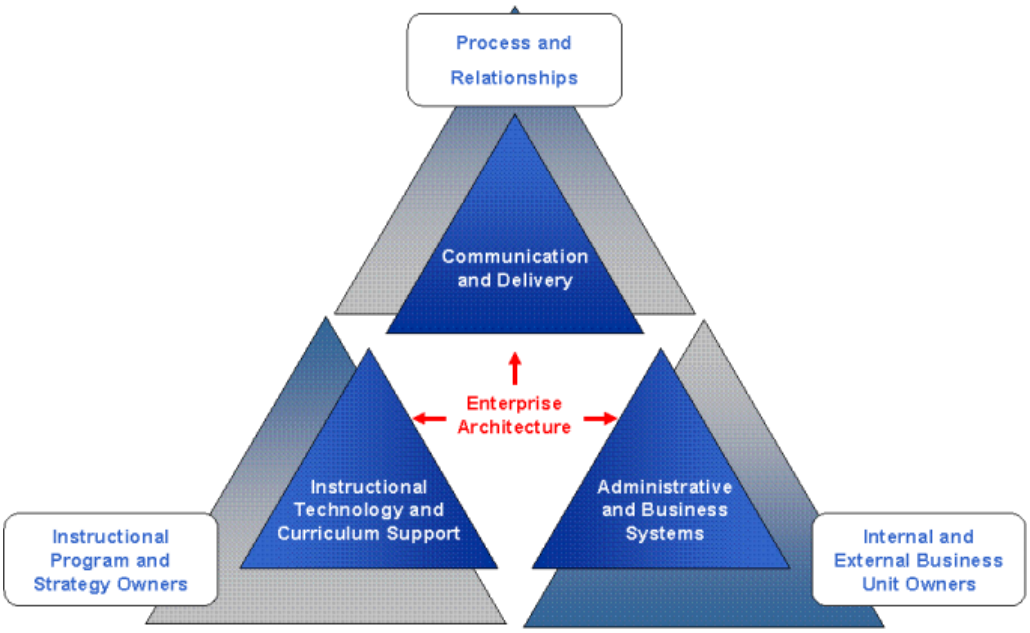
K-12 Educational Technology Framework



Within this broad framework, the technology organization is responding to the needs of a variety of stakeholders, including central staff, administrators, teachers and school staff, students and parents, federal and state government agencies and other public stakeholders. These interactions are shown in the following.

KETS P-12 Technology Organization Interactions

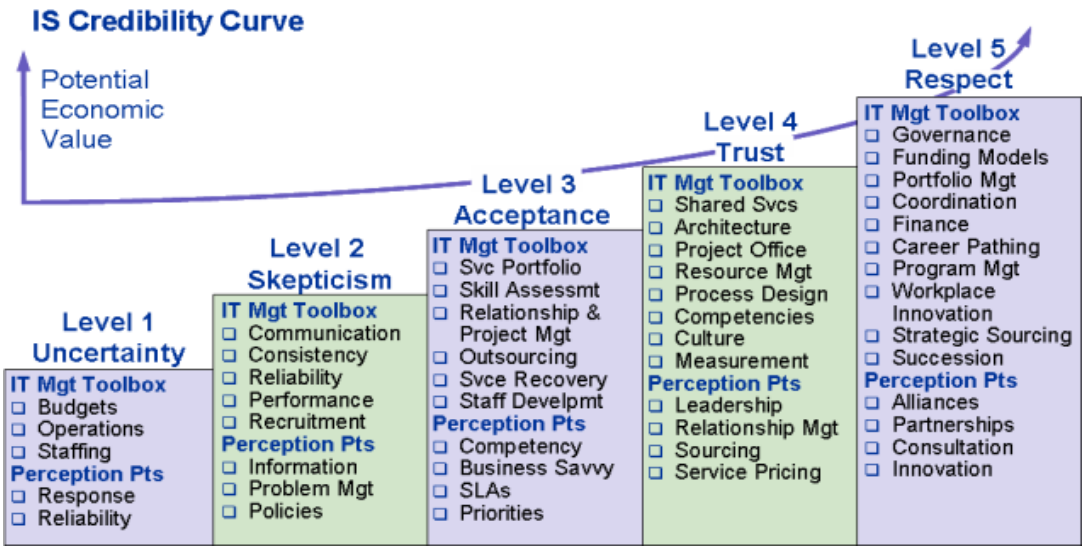
The following figure illustrates the relationship of the technology organization to the educational enterprise as a whole. It shows how these three technology operations (administrative systems, curriculum support and delivery capabilities) are tied together through the enterprise architecture.



Recognizing and Communicating the Value of Technology in Education

Many organizations are challenged to convey the educational value of technology initiatives to gain support and approval of the organization, and K-12 environments are no different.

For K-12, this is a multi-faceted issue, given the traditional dispersion of education technology throughout the organization. The diagram below highlights the IS Credibility Curve and the tools needed to improve education technology's credibility.



In the Education Technology Services Credibility Curve, the credibility of education technology organizations accrues in stages, with each stage depending on programs and practices learned at previous stages and each state potentially increasing business' overall economic value of education technology.

At Stage 1, Education Technology Services Providers are inconsistent and unknown. They do not meet commitments, they make meaningless promises, and they seem impenetrable to the people they serve. At Stage 2, they get their arms around baseline performance and begin to add consistency to operations, services and policies. Educational customers may remain skeptical, however. Stage 3 introduces professionalism to the picture as Education Technology Services Providers establish processes for responding to education needs and requests and increase education awareness of capabilities. At Stage 4, Education Technology Services Providers define effective processes for planning, architecture, project management, funding, sourcing and competency development. Educational organizations actively engage in joint planning and measurement. Finally, in Stage 5, leaders actively seek advice, counsel and innovation from Education Technology Services Providers, which have gained the respect of their customers.

Education Technology Services must master practices, programs and alliances that will elevate them from just technology focused to robust educational centers. The higher the Education Technology Services Credibility, the higher the educational value of education technology.

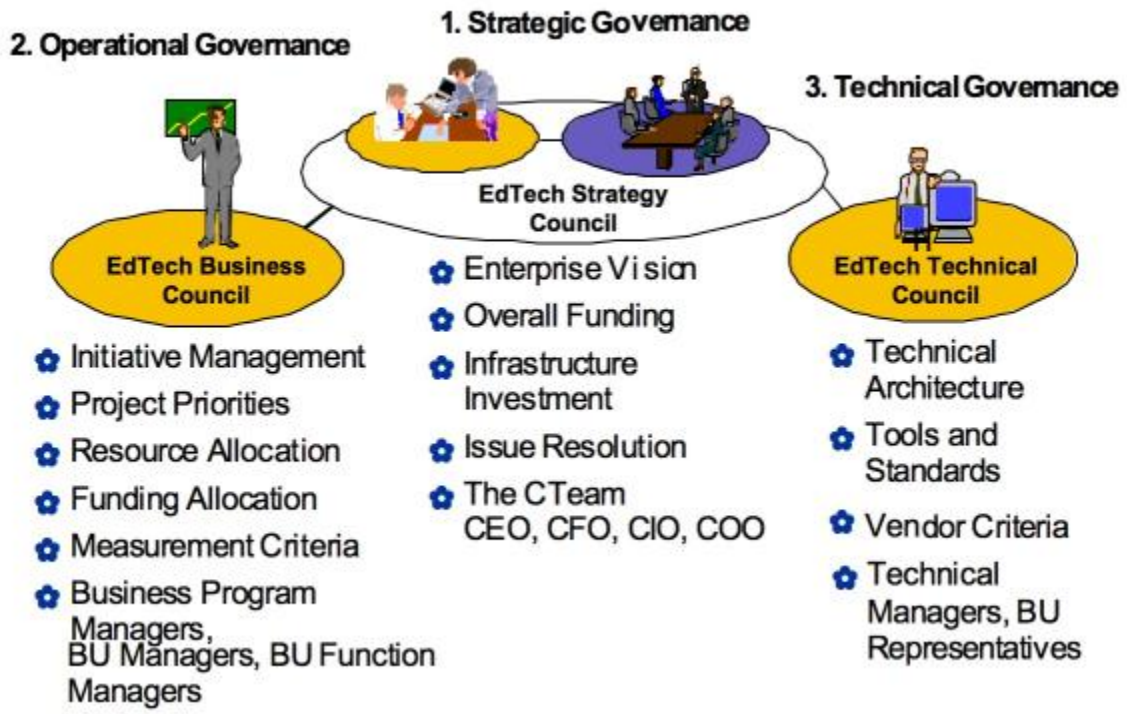
As a result of the gap analysis, the Master Plan has identified a number of initiatives designed to enable the organization to improve the maturity of the education technology function, focusing on education technology providers in the state agency and at the district level.

- Institute a robust governance model
- Implement application and project portfolio management
- Evaluate the organizational structure and enhance governance
- Plan and execute communications
- Implement service-level management capability
- Establish alternative funding models

Governance

Governance can be described as the way that groups of people or organizations make decisions. In Kentucky, providing education to children involves the participation of local schools, school districts and the various state agencies. All are interested in ensuring that students receive the best possible instruction, and each level has certain responsibilities to the student. For instance, local schools are responsible for, among other things, directly providing instruction in the classroom. The schools' challenges and goals have always been unique when compared to those of the state-level agencies. Although school goals usually are aligned with state goals, school-level goals are unique and must be recognized.

Education Technology Governance Recommendations
Three Components of Governance Structure



One of the goals of all levels of education within Kentucky is to ensure that each level has input into the decision-making process. This is necessary in order for informed and optimal decisions to be made. It is extremely difficult to make the best educational decisions for the children of Kentucky unless a well thought-out governance structure is in place.

The governance initiative will involve a review of many items including:

- The best method for schools and districts to effectively voice the educational goals and challenges that are important to them
- The most appropriate people to be directly involved in the decision-making process
- The people or groups of people who are responsible for making certain decisions
- The ideal process by which decisions are made and communicated to all those who are involved

Ultimately, the goal of proper governance in educational technology is to ensure that those who are affected by decisions have a chance to contribute their input, understand who will be making the decisions and have visibility into the way that decisions are made.

Governance reduces complexity in many important ways:

- it clarifies who has input and decision rights in any given decision
- it reduces the importance of politics in decision making, and increases the importance of clearly defined and weighted criteria
- it provides a forum for open debate of priorities and initiatives
- it increases the weight of final decisions making it easier to deal with dissenters

This will result in better decisions being made that will ultimately help students in the state excel. That is how this initiative fits with the common goals of education providers in Kentucky.

Organizational Structure Evaluation

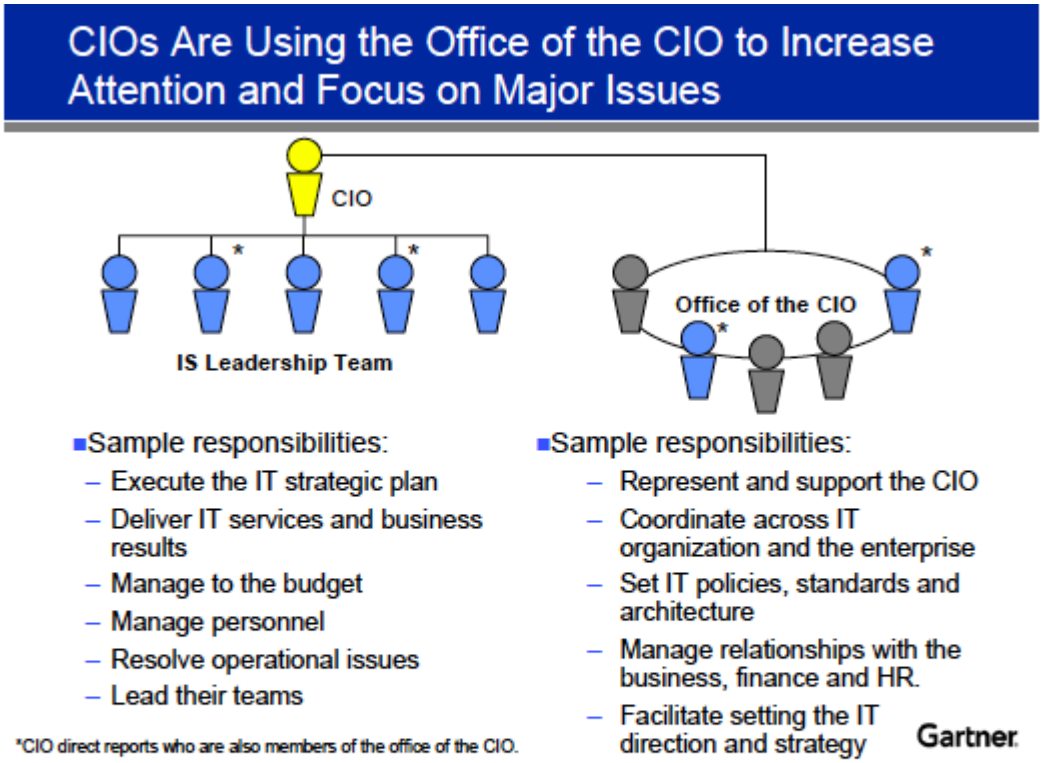
The goal of this initiative is to better organize the schools, districts and state agencies so that educational technology can be provided to the students in the best way.

At this time, there are many educational technology providers who create, deliver and support educational technology, and this can often confuse people in the schools and districts. People need to know whom to ask when they have a question or problem, and different groups who help with educational technology do not always understand what the other groups are doing.

There are different types of educational technology organization types. This initiative is meant to analyze the different organizational models to understand the best structure with which to move forward.

Although organizational structure can either help or harm the way schools and districts use educational technology, it is not the only factor to consider. There is no one right structure. What is important is understanding what the schools, districts and state agencies really need.

For example, all education technology organizations serve similar purposes and have similar accountabilities, but their personality profiles, management systems, processes, constraints, strengths and weaknesses make each education technology organization unique. There are, however, certain best practices and attributes for ensuring an optimized education technology organizational structure, which derive from evolving educational paradigms.



The office of the CIO is distinct from operational management and direct lines of reporting. It provides an organizational structure for addressing CIO management capacity pressures, thus reducing complexity for the CIO. An office gives CIOs options to leverage their time and build skills in the IT organization, and implements the principles of IS Lite. CIOs define the scope and roles of the office to fit their needs. Toyota Motor Sales, U.S.A. manages issues of supply and demand through an office of the CIO; Amerada Hess coordinates IT globally through an office of the CIO. CIOs choose a model for the office based on context and need.

Integrate Technology into Core Education Mission Activities

Research has shown that the greatest return on investment in education technologies occurs when organizations ensure their investments are aligned with the strategy and mission of the organizations. Historically, education technology investments are categorized into one of three types of investments, each leading to an increasing level of value to the organization, as shown in the following figure:

Value of Education Technology Investments

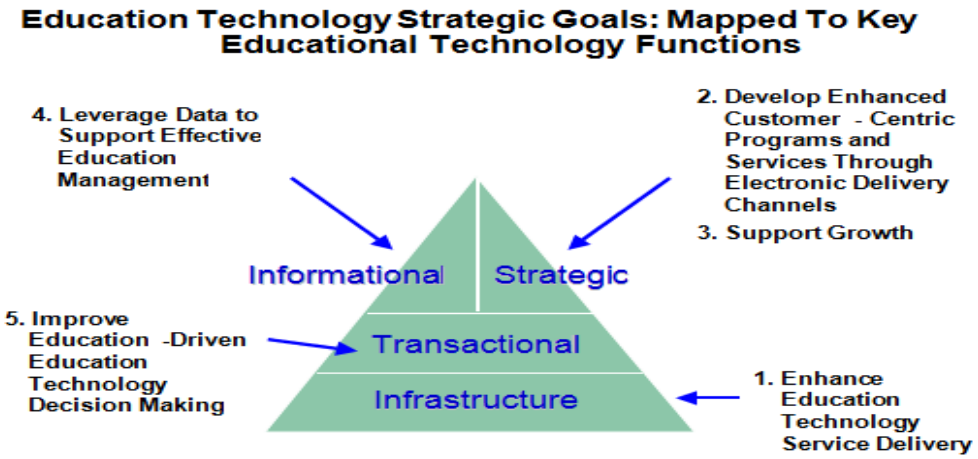
- The *infrastructure* investments focus on the technology components needed to enable effective use of technology throughout the organization. They include, but are not limited to, applications and technologies such as e-mail, communications and networking, computing workstations, printers, servers and data centers.
- *Transactional* investments provide technology applications that automate the administrative processes, including financial, human resources and student administrative applications. They typically offer educational productivity improvement

and offer opportunities for individuals to carry out the work of education more efficiently and effectively, thereby improving the organization's internal performance.

- *Transformational* investments provide capabilities that are mission-oriented. They directly support those activities critical to the mission of education. They typically offer opportunities to collaborate in new ways and foster innovation for the organization, changing the way it achieves its mission. Transformational investments may provide informational capabilities not previously available (such as ability to access, report, manipulate and trend) or strategic capabilities, both customer-oriented and external in nature.

While the infrastructural investments are clearly needed to enable the more strategic activities, it is usually difficult to demonstrate the linkage between the pure infrastructure investments and the mission-oriented, transformative investments.

In many organizations, the technology evolves so that the infrastructure provides the foundation, transactional education technology solutions are deployed, and as organizations become accustomed to the capabilities provided, they identify needs for new information and strategic solutions that would help them be more competitive or achieve the mission of the organization more easily. As new capabilities are deployed, they become part of the infrastructure being managed.



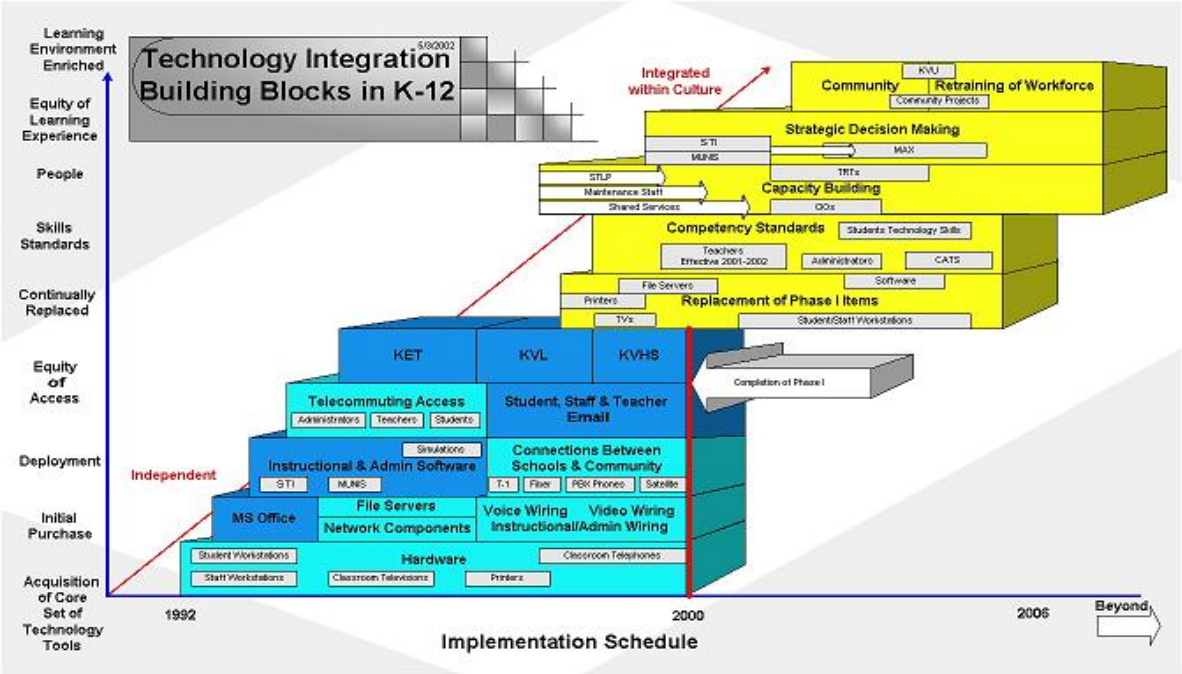
As represented in the Technology Master Plan, KDE and districts must be positioned to focus on both an infrastructure and mission-oriented solutions. This is evidenced by the increasing requirements for strategic investments in online assessment, the next generation of the

Internet, strategic data systems, instructional aids and professional development. This has resulted in the following recommendations and initiatives for KDE:

1. Execute core education technology strategies to enable business capabilities.
    - education data warehouse and education business intelligence
    - security
    - enterprise content management
    - networking
    - authentication
    - capacity planning
    - portal
    - enterprise architecture

2. Implement key educational driven technology strategic initiatives

The 2013-2018 Master Plan builds upon the previous Technology Integration Building Blocks for K-12. While the previous building blocks were and are still important, this master plan has continued to move along the arrow where technology is now very integrated within the educational culture to the point that it is a key tool to enhancing the learning experience and helping Kentucky meet the goals of its educational plan (e.g., Unbridled Learning).



KETS P-12 Technology Organization Interactions

KETS Has Been Implementing Cost-Saving Best Practices

Ed Tech Efficiency Best Practices	What KETS Has Accomplished
▪ **Developing a centralized model for computing infrastructure** □ Agency units no longer own or operate major portions of their infrastructure. □ Large-scale computing (mainframes enterprise servers) are consolidated at the enterprise level (or outsourced) under the CIO or central data center.	✓ **Consolidated servers through active directory and exchange migration** □ Standardizes the state on single-server operating system and consolidates server computing infrastructure platform □ Consolidated 4,400 servers to under 400 servers used for active directory, e-mail and Web servers □ No state has accomplished this, and savings are in the millions in the long run.
▪ **Consolidating network infrastructure and management** □ Done through consolidation of physical networks or contracts with bandwidth suppliers □ Capacity is used more efficiently, and fewer resources are required to support the network.	✓ **Implemented centralized active directory services** □ Active directory allows enterprises to organize their networks into a single, centrally-managed structure and automates many network management tasks. Goal is to improve security, reduce recurring costs and complexity, stabilize backbone services and lay foundation for better collaboration over the network.
▪ **Creating a standard enterprise architecture** □ Develop and enforce education technology standards □ Reduce the complexity and expense running the infrastructure and ensure the enterprise interoperability of applications	✓ **Developed IT standards, enforced by statute** □ Education technology standards for available for desktops, servers, printers network equipment and wiring. □ KRS 156.160(1) stipulates that the Kentucky Board of Education has a statutory mandate to prescribe IT standards, which school districts shall meet.

KETS Has Been Implementing Cost-Saving Best Practices

EdTech Efficiency Best Practices

- **Desktop Computing**
  - Short term savings for desktop computing is largely limited to postponing purchases.
  - Long term savings from desktop costs can be significant, and all enterprises should empower the CIOs to set desktop standards for hardware, software, training and the Help Desk.
  - The enterprise should commit to no more than two or three desktop platforms (one is ideal), one standard for laptops and one office software suite.
  - The financial advantages include:

    - **Economies of scale on procurement**: Larger volumes enable great price discounts.

    - **Training**: With fewer platforms, there are fewer products on which to be trained. More importantly, as people transfer from one part of the organization to another, there is no loss in productivity due to lack of training.

    - **Help Desk support**: Fewer products to support will reduce the complexity of the Help Desk environment. It also enables an enterprise Help Desk consolidation that will provide consistent, universal services to all agencies in the organization.

What KETS Has Accomplished

✓ **Standard for Procurement of Statewide Education Desktop Computing**

- Master contract defined the standards for procuring new computers.
- Savings are potentially high.

✗ **Cost efficiency currently is greatly reduced by having no minimum standards for already-deployed desktops and other infrastructure components.**

- Minimum standards stipulate the minimum configuration of desktops deployed.
- With no minimum standards, older, outdated desktop hardware and software are allowed to proliferate.
- Kentucky has many versions of platforms (XP, Vista, Windows 7, Mac OS9 and Mac OS10). As a result, Kentucky is ranked very low in the U.S. in terms of the quality of its desktop computing infrastructure.
- This has occurred due to a lack of technology refreshment and deferred purchases that save on the short term, but are inefficient in the long term.

KETS Has Been Implementing Cost-Saving Best Practices

Ed Tech Efficiency Best Practices

- **Standardize & centralize enterprise applications**
  - Common systems for e-mail, financial management and information management save a great deal of money compared to fragmented approaches.
  - The lack of an enterprise strategy for these types of applications often results in costs that spiral upward.
  - Centralizing applications can save significant resources in the long term, but not the short term.
- **Implement the use of master ed tech contracts**
  - Organizations reap considerable savings by consolidating contracts for hardware, software and services.
  - Fewer, larger contracts may generate better pricing and economies of scale.
  - There are many advantages to creating a master contract with pre-qualified vendors able to provide services on demand. These contracts ensure that work gets done in a time-sensitive manner without the need for time-consuming, costly procurement processes.

What KETS Has Accomplished

✓ **Standardized and centralized major KDE and district applications**

- No other state has successfully standardized statewide applications for education to the extent of Kentucky's. Examples include the statewide student information, financial management and network and e-mail systems.
- KDE is saving millions through this strategy.

✓ **KETS has created master vendor contracts that districts and KDE use for education technology procurement.**

- Contracts exist for the following education technology components:
  - desktops, laptops and printers
  - file servers
  - networking equipment
  - Microsoft Office and virus protection software
- KDE is saving millions through this strategy.

The Gartner Group is considered the consumer reports of the technology industry. Their findings of KETS and best practice recommendations are still applicable going forward over the next 6 years.

Enhancing Education Through Technology
(http://www2.ed.gov/rschstat/eval/tech/netts/netts-vol1.pdf)

Volume I of the State Strategies and Practices of Educational Technology. The primary goal of this program is to improve student achievement through the use of technology in elementary and secondary schools. Additional goals include helping all students become technologically literate by the end of the 8th grade and, through the integration of technology with both teacher training and curriculum development, establishing innovative, research-based instructional methods that can be widely implemented. Volume II can be found by clicking here (http://www2.ed.gov/rschstat/eval/tech/netts/netts-vol2.pdf).

The Nine Elements of Digital Citizenship in Schools
(http://www.iste.org/images/excerpts/DIGCI2-excerpt.pdf)

While immersed in a technology society, it is important that students develop and retain the good people skills that are important for every citizen to have. Districts that take the time to address these nine elements with their students and staff will avoid problems while they are at school as well as improving activities at home that might have an impact at school. KDE emphasizes and annually tracks each district's progress in each of the nine elements, among many others. Federal technology funding has very recently become interested in these items.

1. Digital Access: full electronic participation in society
2. Digital Commerce: electronic buying and selling of goods
3. Digital Communication: electronic exchange of information
4. Digital Literacy: process of teaching and learning about technology and the use of technology
5. Digital Etiquette: electronic standards of conduct or procedure
6. Digital Law: electronic responsibility for actions and deeds
7. Digital Rights & Responsibilities: those freedoms extended to everyone in a digital world
8. Digital Health & Wellness: physical and psychological well-being in a digital technology world
9. Digital Security (self-protection): electronic precautions to guarantee safety

Many Kentucky schools use these nine elements as the basis for a training course, the successful completion of which will result in a Digital Driver's License. This license ensures that the students are not only exposed to the nine elements, but understand why they are important and can apply them in their digital interactions.

iDriveDigital.com

http://ignition.everfi.net/

Studies and Research

Within recent years, several studies and initiatives at national and local levels have been conducted that are integral to education technology within the Commonwealth of Kentucky. Several studies yield recommendations that directly impact the strategic direction of KETS. This section contains a brief summary of each related connection with a link to the full publication. These connections collectively drive our efforts on a daily basis.

OEA Review of Education Technology Initiatives
(http://www.lrc.ky.gov/lrcpubs/RR363.pdf)

This 2009 publication is the result of the Office of Education Accountability's (OEA's) review of Kentucky's education technology, inclusive of funding, governance and status of related initiatives and projects. The study names several accomplishments as well as some areas in need of improvement.

- Accomplishments
  - Increased Opportunities
  - Access
  - Kentucky Education Technology System Master Plan
  - Deployment
  - Operational Efficiency

- Areas Needing Improvement
  - Governance
  - Security
  - Evaluation of Impact of Technology Initiatives
  - Financial Data
  - Individual Learning Plans
  - Virtual Learning Initiatives

2011 Facilities Assessment Project
(http://education.ky.gov/districts/fac/Pages/Facilites-Assessment-Project.aspx)

A majority of Kentucky school facilities was evaluated and assigned a score for each key area. The aggregate score for technology readiness was 89.9 percent, which reflects the progress made by districts in recent years.

- **Final School Reports** (http://education.ky.gov/districts/fac/Documents/KFICS Links to Final School Reports.xls) – An Excel file with links to individual detailed school reports.

- **Individual School Scores by School** (http://education.ky.gov/districts/fac/Documents/KFICS%20State%20Report%20School%20List%20by%20Kentucky%20School%20Score.pdf) - A detailed PDF score list sorted by school.
- **KFICS Annual Report** (http://education.ky.gov/districts/fac/Documents/2011%20KFICS%20Annual%20Report.pdf) - 2011 KFICS Annual Report.

Kentucky Long Term Policy Research Center (KLTPRC)
(http://www.kltprc.info/pubs/pubs_Index_1994-2010.htm#Education)

Created by the Kentucky General Assembly in 1992, the KLTPRC was envisioned as an independent research entity that would be able to help the Commonwealth take advantage of opportunities and avoid problems. Funding for the KLTPRC was suspended in 2010 due to an overall dire budget situation, but most of the work, a great deal of which centers on education, has been preserved on its website. The link takes one directly to research focused on education.

KDE Data System Portfolio Assessment
(http://education.ky.gov/districts/tech/kmp/Documents/ExecutiveSummaryKDEDataPortfolioAssessment.doc)

Commissioned by the Kentucky Department of Education to identify redundancy among data systems, the Commonwealth Office of Technology's (COT) data system survey was accomplished over a period of a year, recorded 190 separate systems and provided the department with recommendations to improve efficiency, data integrity and data security.

2008 America's Digital Schools Study
(http://www.greavesgroup.com/images/stories/pdf/ADS2008KeyFindings.pdf)

Excerpted from the study: "ADS 2008 is an invaluable source of hard data for long-range planning, essential for both education and industry leaders" around areas essential for technology success, such as teacher buy-in, professional development and understanding Total Cost of Ownership.

The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness
(http://education.ky.gov/districts/tech/kmp/Documents/Technology%20Factor.pdf)

Project Red, the group responsible for this study, seeks to understand and define the specific implementation strategies that are successfully transforming schools with technology. Project RED has identified the nine key implementation factors (KIFs) that are linked most strongly to the education success measures.

1. Intervention classes: Technology is integrated into every intervention class period.

2. Change management leadership by principal: Leaders provide time for teacher professional learning and collaboration at least monthly.
3. Online collaboration: Students use technology daily for online collaboration (games/simulations and social media).
4. Core subjects: Technology is integrated into core curriculum weekly or more frequently.
5. Online formative assessments: Assessments are done at least weekly.
6. Student-computer ratio: Lower ratios improve outcomes.
7. Virtual field trips: With more frequent use, virtual trips are more powerful. The best schools do these at least monthly.
8. Search engines: Students use daily.
9. Principal training: Principals are trained in teacher buy-in, best practices, and technology-transformed learning

Click here (http://pearsonfoundation.org/downloads/ProjectRED_TheTechnolgyFactor.pdf) to view the complete publication.

The New 3 E's of Education: Enabled, Engaged, Empowered
(http://pearsonfoundation.org/downloads/ProjectRED_TheTechnolgyFactor.pdf)

A national initiative of Project Tomorrow, the Speak Up National Research Project annually polls K-12 students, parents, and educators about the role of technology for learning both inside and outside the classroom. Published in the spring of 2011, the Speak Up 2010 National Findings indicate the following key trends are on the rise in education.

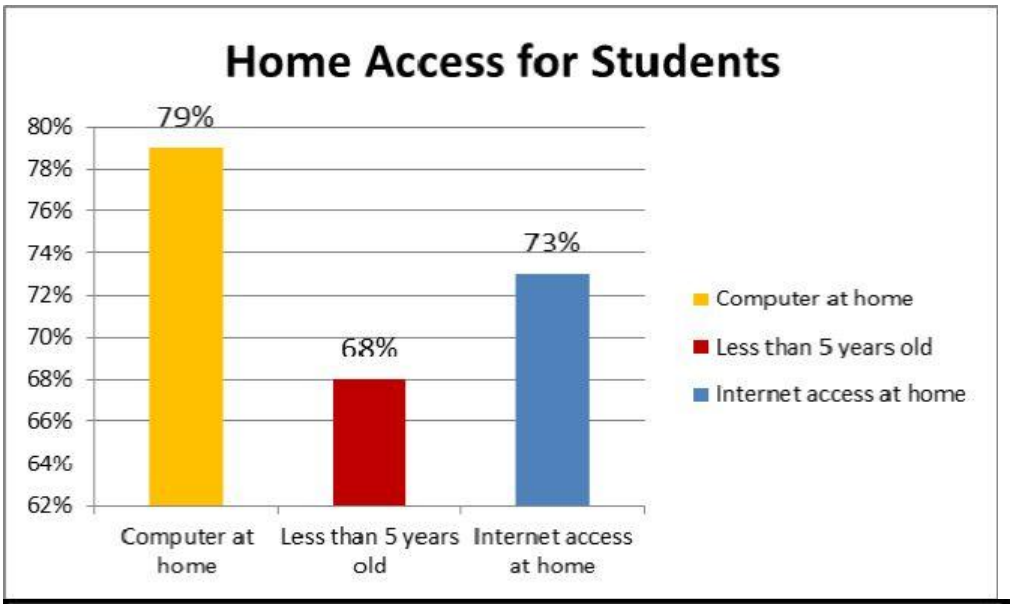
- Mobile Learning – As the number of personally-owned mobile devices continues to increase within the K-12 environment, so does the interest in leveraging these devices within the classroom.
- Online and Blended Learning – Encompassing self-study online courses, instructor-led online classes as well as blending/hybrid learning environments, this area has gained significant popularity in recent years.
- E-textbooks – Although interest has increased, the actual use of electronic textbooks remains an emerging trend in most schools and communities.

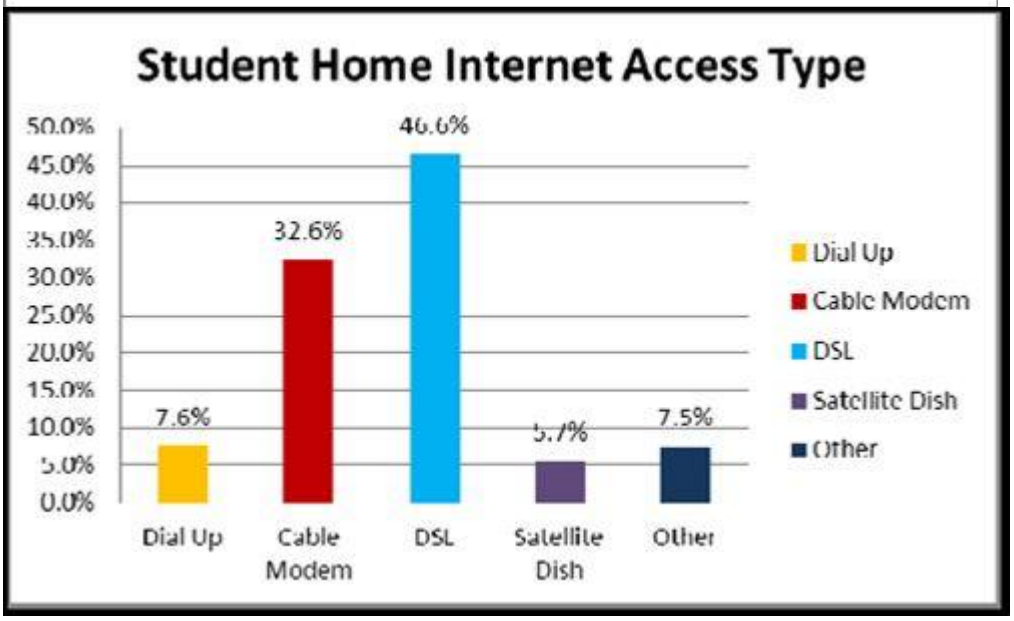
The complete report, subtitled *How Today's Educators are Advancing a New Vision for Teaching and Learning,* is concise yet informative and serves as an excellent resource for education technology leaders and teachers.

Technology Readiness Survey
(http://openhouse.education.ky.gov/reports/Technology_Readiness_Survey_-_2011_Highlights.pdf)

Conducted annually by KDE, this survey provides a snapshot of the technology environment throughout Kentucky's schools and districts. This is a key component of monitoring trends and

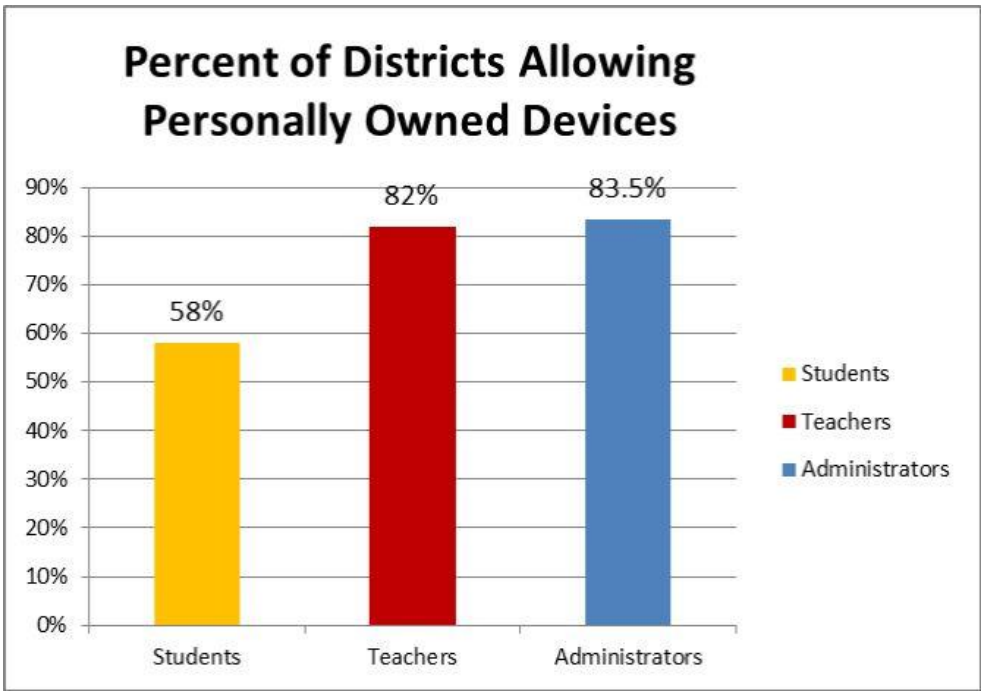
activities for the use of technology in education, as reflected within the 2011 summary. More students have computers (79 percent) and Internet access (73 percent) at home. These percentages are up 1 percent from 2010. Of those students who have Internet access at home, approximately 79 percent have broadband (high-speed) access such as cable modem or DSL (usually provided by the local telephone company). Refer to Section 1 of the Survey, Home Access for Students for data.

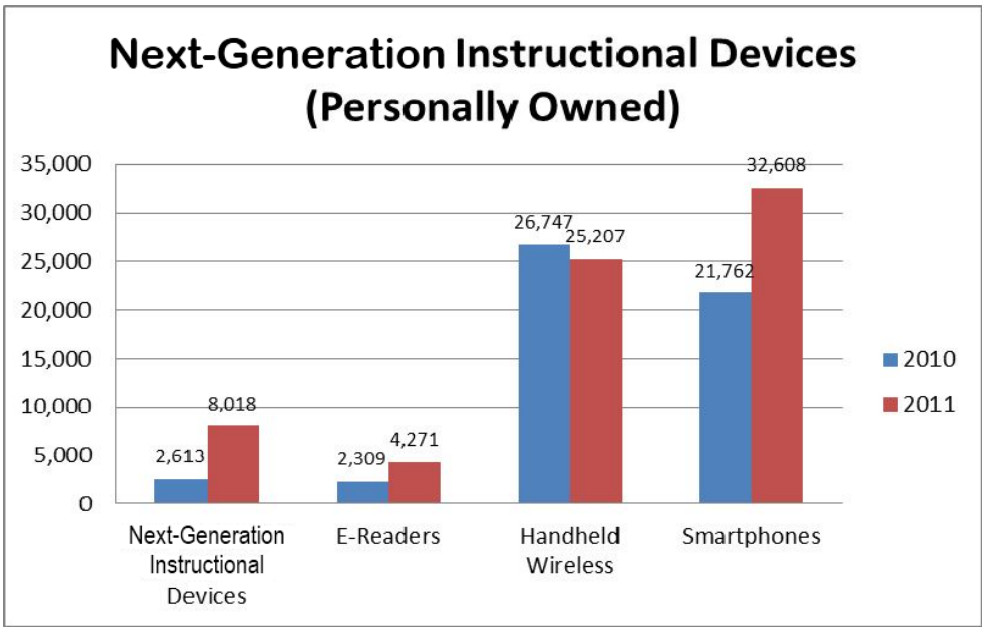




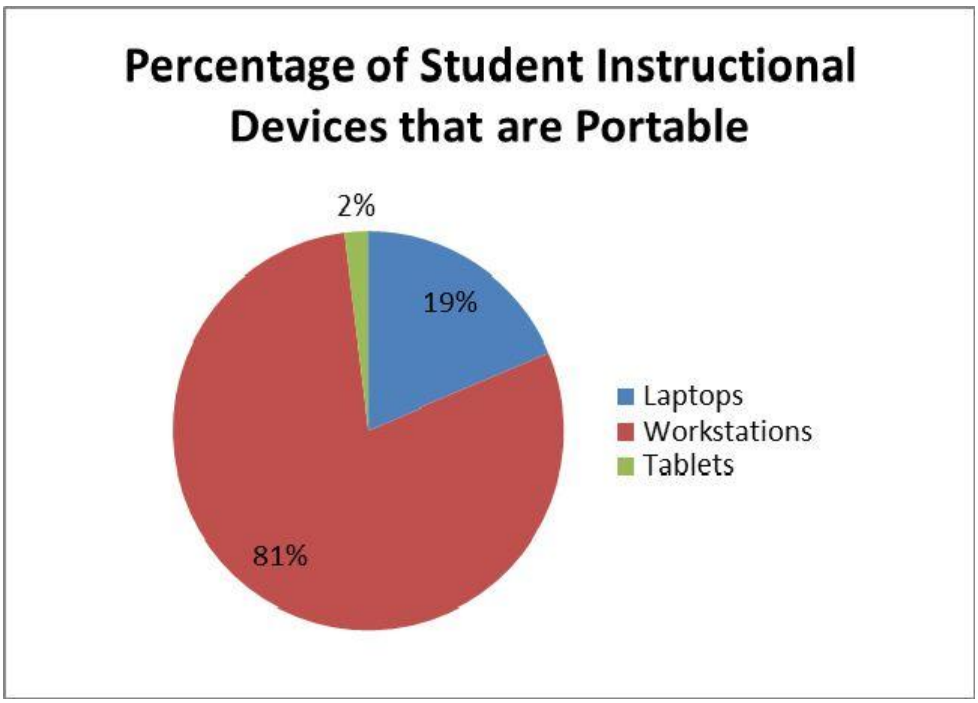
Approximately 58 percent of districts allow students to bring personally owned instructional devices -- laptops, tablets, mobile devices -- to school. Almost 82 percent of districts allow teachers and 83.5 percent allow administrators to bring personally owned instructional devices to school. These percentages have continued to increase over past years as more districts are

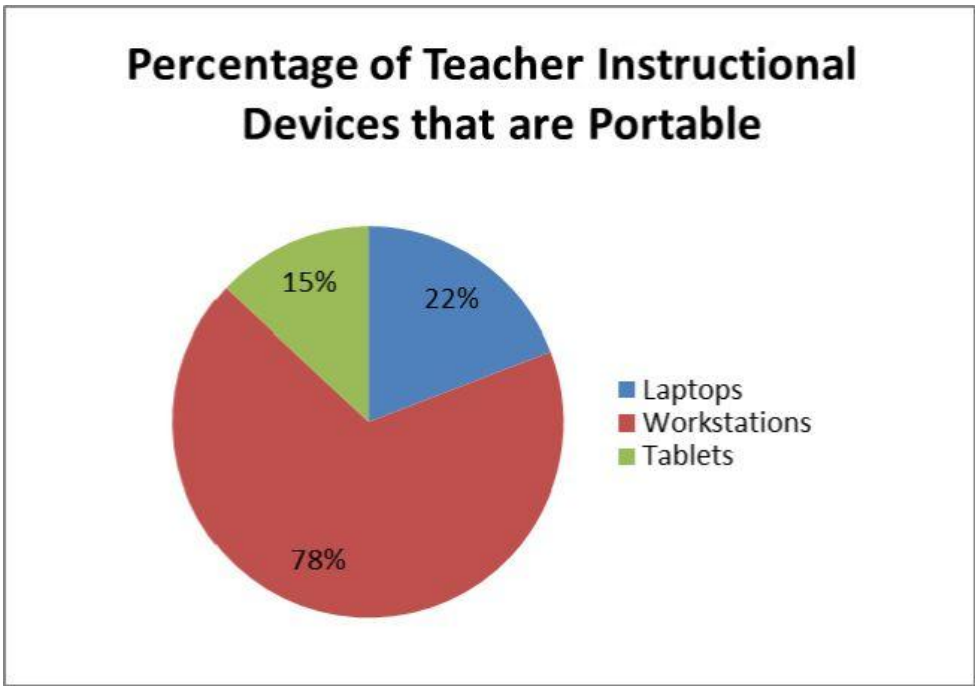
moving toward a "bring your own device" policy and plan. Refer to Section 4 of the Survey, Personally Owned Computing Devices for data.

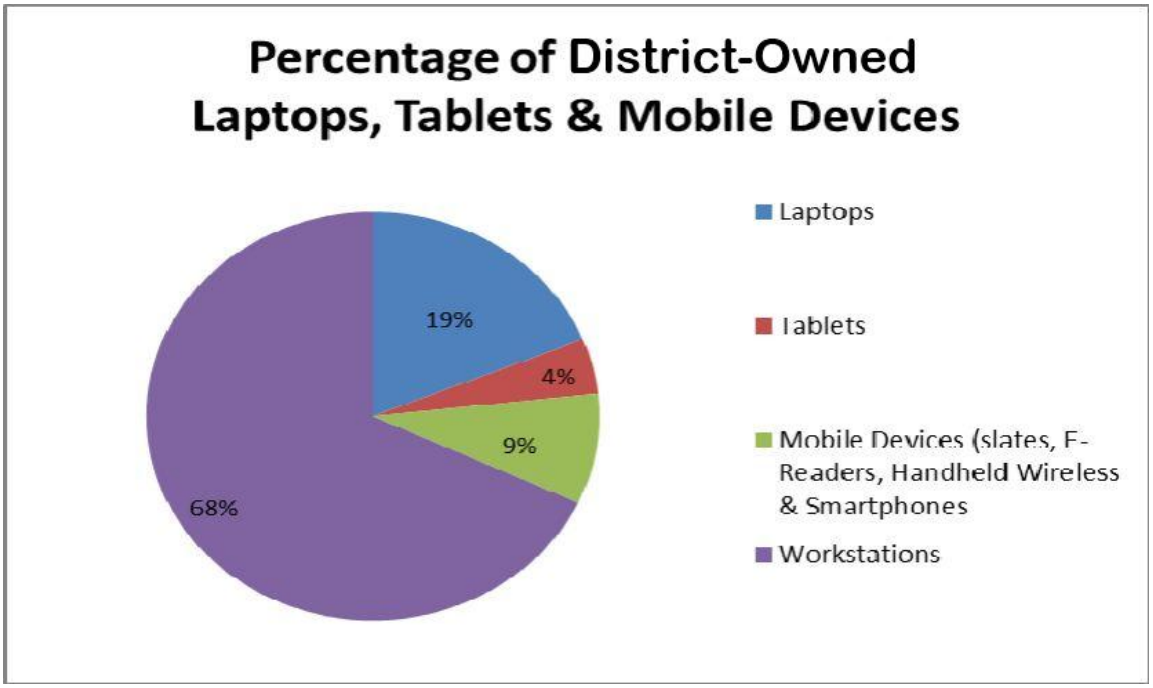


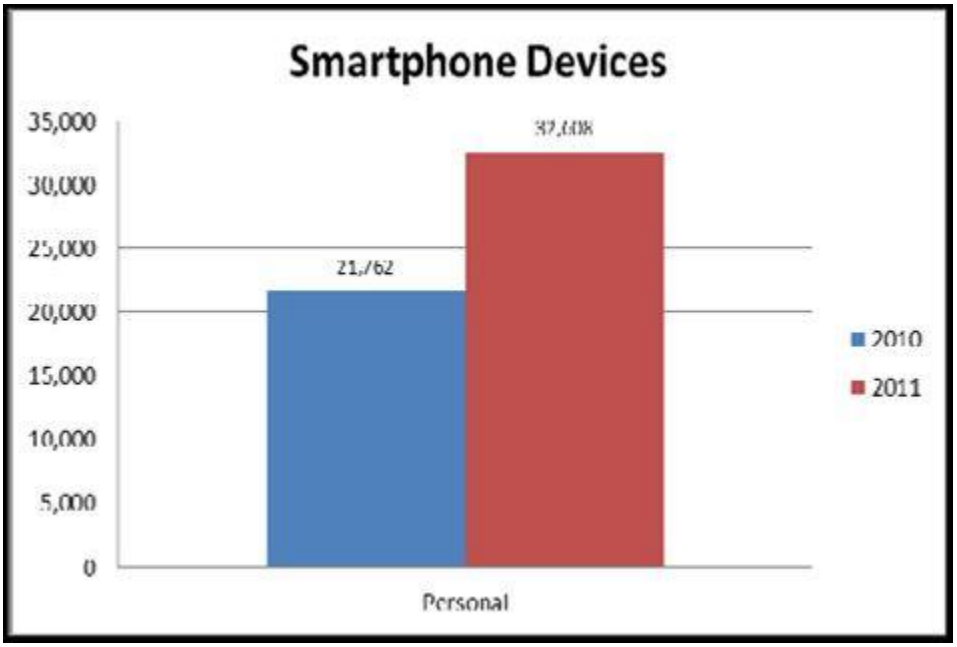


Almost one-third of district-owned instructional devices are mobile, which is defined as laptops, tablets and next-generation instructional devices. This tends to reflect the growing recognition of ease of access as a key component of always on, anywhere and anytime learning. Refer to Section 2 of the Survey, Total Number of Instructional Devices that are Laptops/Tablets for data.

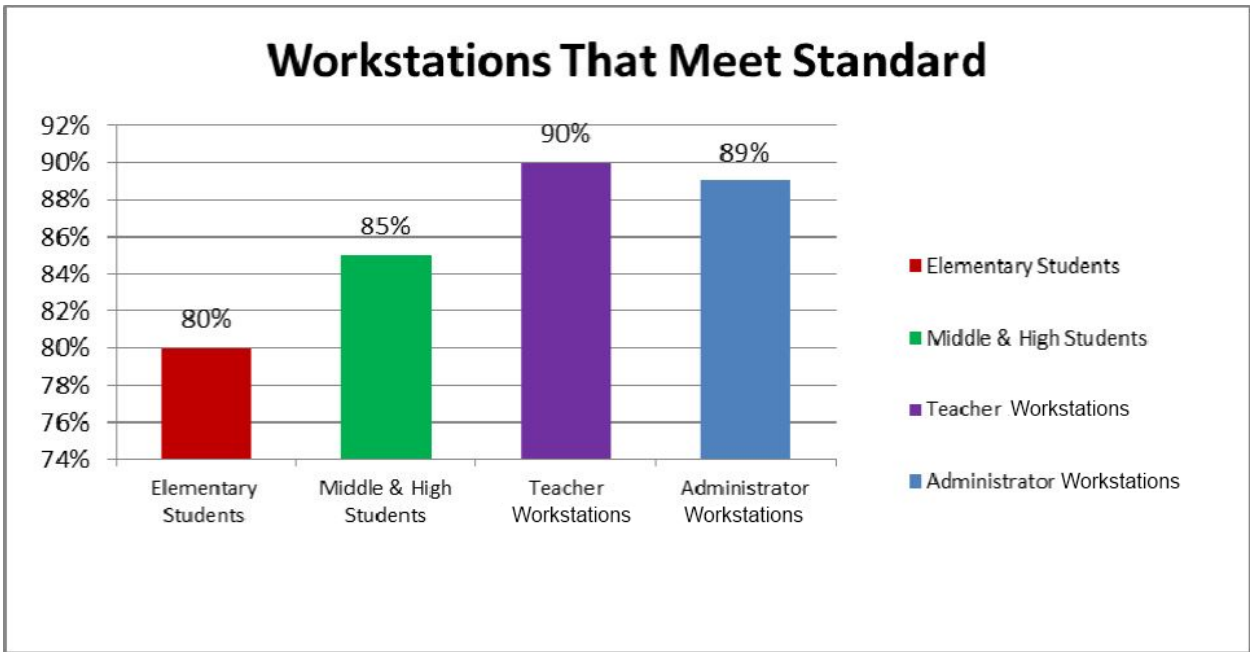

Percentage of Student Instructional Devices that are Portable
2%
19%
81%
Laptops
Workstations
Tablets


Percentage of Teacher Instructional Devices that are Portable
15%
22%
78%
Laptops
Workstations
Tablets



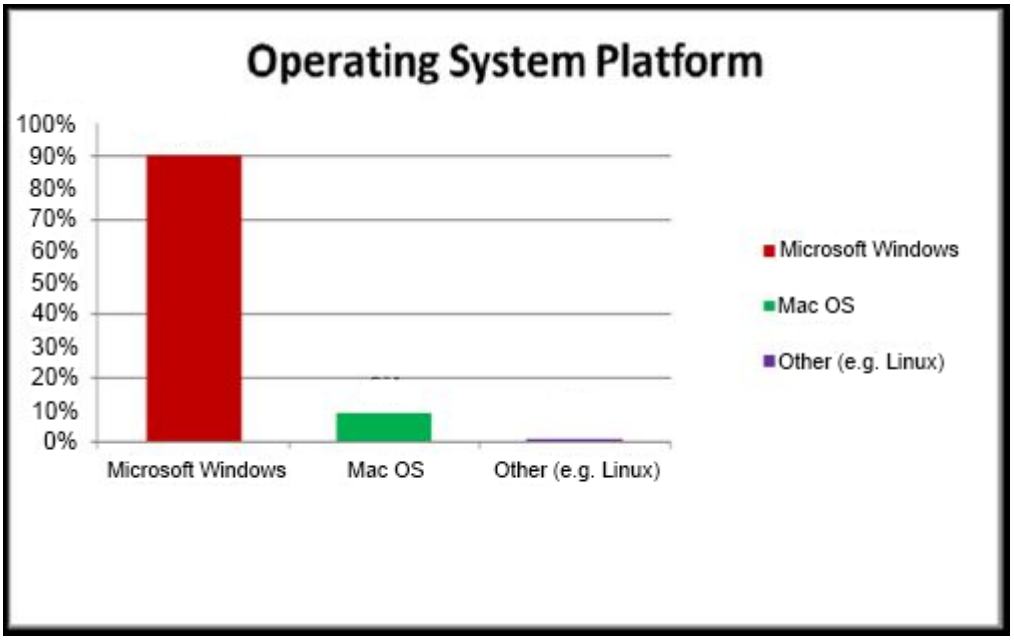


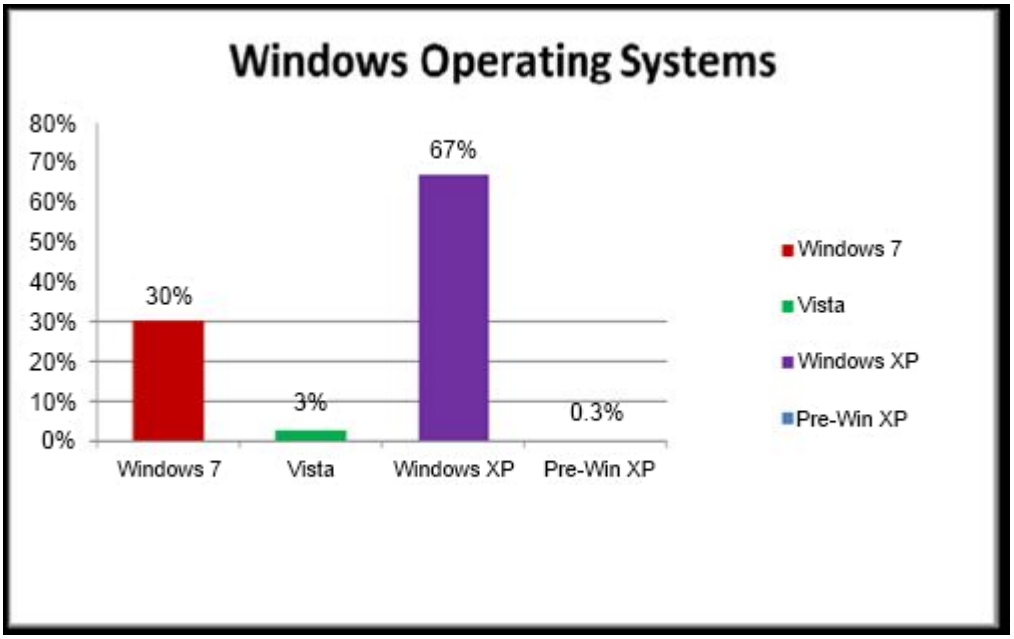
The infusion of $50 million in funding from the Kentucky General Assembly for the Instructional Device Upgrade Project during FY06 and FY07 resulted in an ongoing increase to the number of devices that meet or exceed minimum standards to the point that 83 percent of student devices currently qualify. However, without continued funding methods being available for refreshing student instructional devices, districts will begin to see this number decrease, slowly in calendar year 2012 and then rapidly decreasing through 2014. Refer to Section 2 of the Survey, Total Number of Instructional Devices for data.



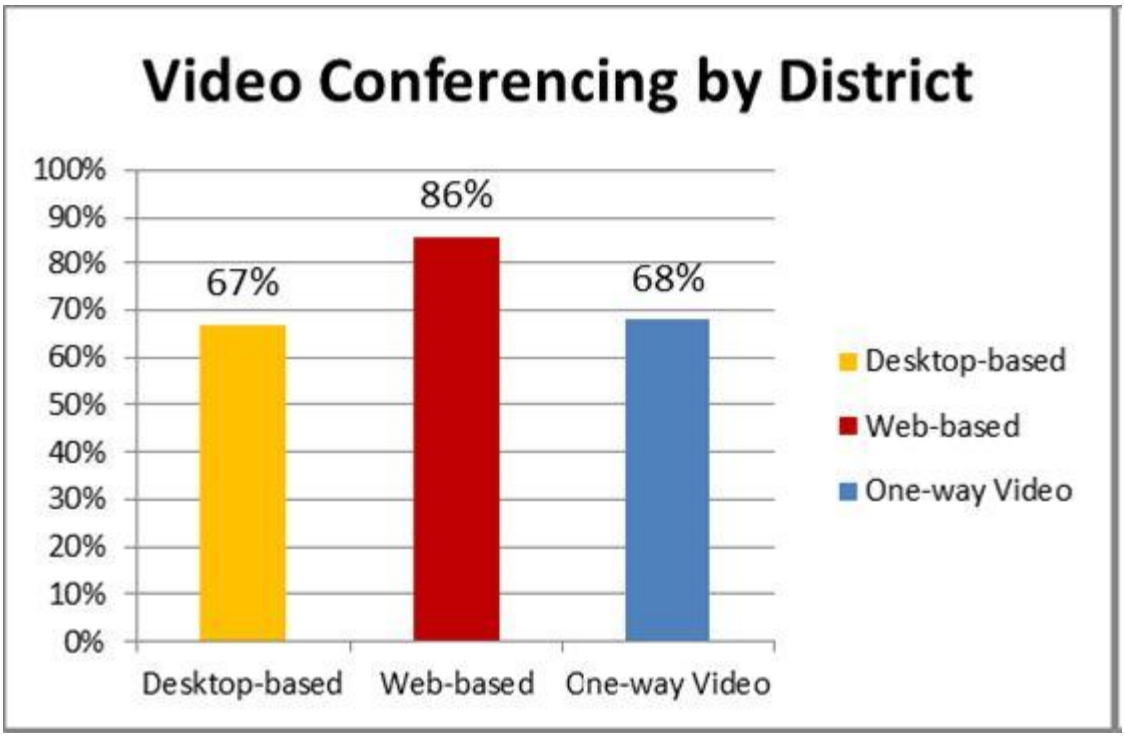
Kentucky schools report a total of 261,398 student instructional devices that meet or exceed minimum technical standards -- desktops, laptops and tablets. This is almost 12,000 more devices that meet and/or exceed the minimum standards than districts owned in 2010. Refer to Section 2 of the Survey, Total Number of Instructional Devices for data.

Multiple factors are leading districts to move to the latest versions of the Windows OS and/or the latest Microsoft productivity suite. This is due in part to more districts participating in the Microsoft licensing agreements as well as the retirement of older machines. Twenty-nine percent of all instructional devices running Microsoft Office utilize the latest version (Office 2010). 30 percent of all instructional devices using a Windows operating system run Windows 7. Refer to Section 3 of the Survey, Instructional Device Software for data.





Districts are now taking advantage of video-based communications to improve both communications and remote learning opportunities. Almost 67 percent of all districts use desktop-based communications like WebEx, Elluminate and others, while nearly 86 percent of districts use Web-based options such as iChat and Skype. Refer to Section 9 of the Survey, Video Conferencing/Web 2.0 Collaboration/Online Assessment for data.

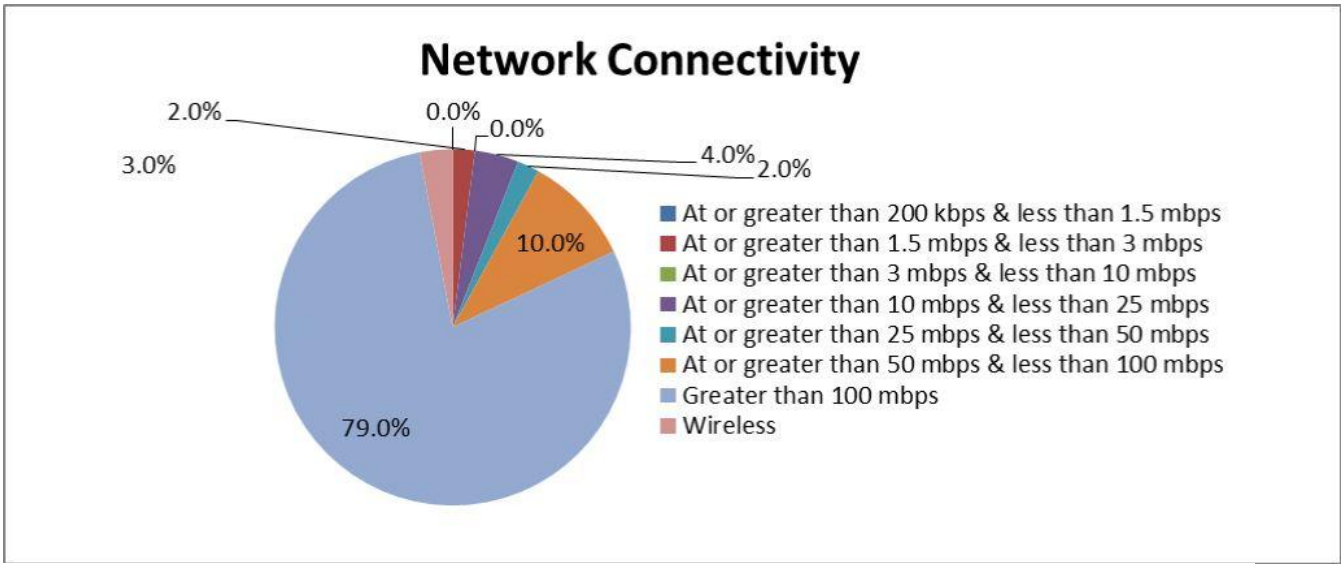


The majority of districts (82 percent) have adopted digital citizenship curriculum or policies for students and staff. Sixty-eight percent of districts assess students' technology skills. Refer to Section 5, Student, Instruction and Leadership Technology Skills for data.

The data below indicate the percentage of districts that have adopted the nine elements of Digital Citizenship as part of a technology culture through either curriculum or an Acceptable Use Policy for students and staff.

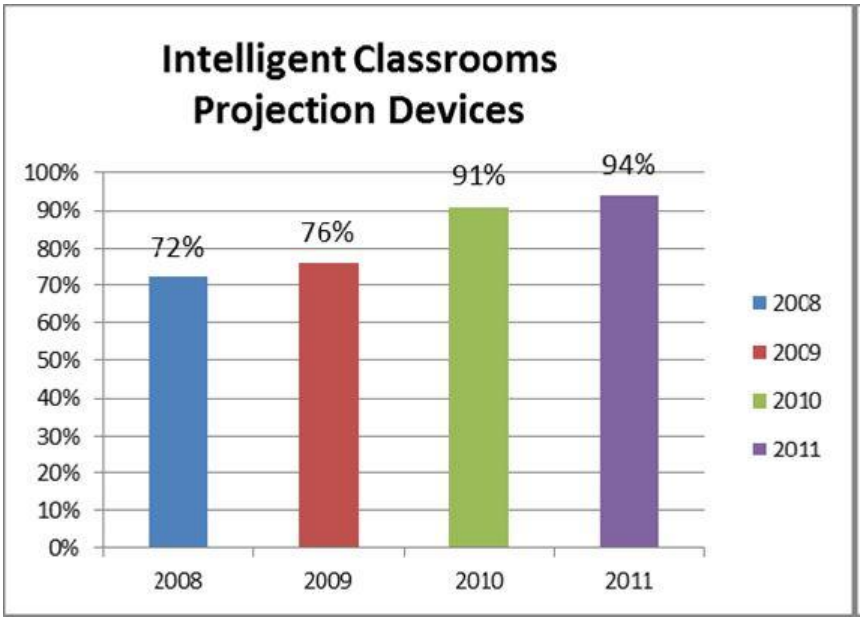
- Digital Access – 95%, increase of 4% from 2010
- Digital Commerce – 60%, increase of 6.5% from 2010
- Digital Communication – 90%, increase of 3% from 2010
- Digital Literacy/Education – 85%, increase of 4% from 2010
- Digital Etiquette – 86%, no change from 2010
- Digital Law – 72%, increase of 3% from 2010
- Digital Rights and Responsibilities – 93%, increase of 3% from 2010
- Digital Health and Wellness/Safety – 72%, decrease of 7% from 2010
- Digital Security/Self Protection – 86%, increase of 1% from 2010.

Thanks to investment by districts and KDE, the number of schools connected by fiber-like connections (large Internet highways) to the Internet continues to increase each year from 67 percent in 2006 to 96 percent in 2011. The increase enables schools to use more diverse Internet-based instructional and assessment opportunities for students. Refer to Section 6 of the Survey, Network Connectivity for data.

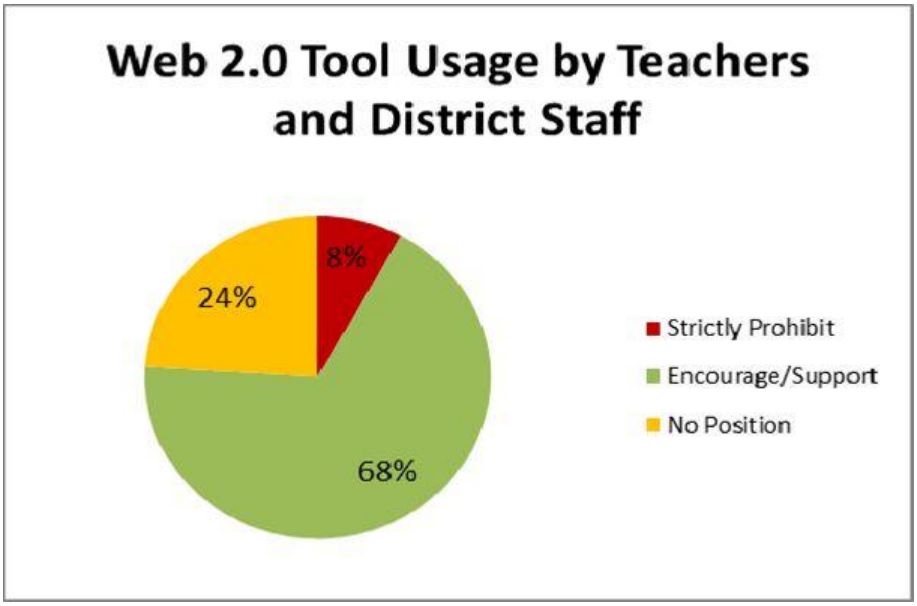


It is estimated that, during the next two years, districts will replace approximately 40 percent of the telephone systems within school buildings. Of these schools, 83 percent will choose to transition to Voice Over IP (VOIP) with their phone upgrades. This allows school districts to leverage their investment in fiber technology to reduce recurring costs by investing in non-traditional phone systems such as VOIP, managed and/or hosted Voice Services. Refer to Section 7, Ease of Access to Telephonic Services for data.

Since 2007, access to LCD projectors or other large-area viewing devices (i.e., plasma or LCD large-screen televisions) has become an expected part of the instructional classroom. Data show that there were 1,540 classrooms and 1,719 projection devices added. This leads us to believe that almost every classroom has a projection device included. Students no longer must use desktop monitors or small televisions for viewing instructional materials. School districts are investing in Intelligent/Smart Classroom technologies to further the educational experiences of students. Refer to Section 8, Intelligent Classrooms for data.



Almost 68 percent of all schools and districts encourage teachers and district staff to use Web 2.0 tools (e.g., Facebook, Twitter, YouTube), yet only half of all districts have a board of education policy addressing the issue. Only 8 percent of districts strictly prohibit the use of Web 2.0 by teachers and district staff. Refer to Section 9, Video Conferencing/Web 2.0 Collaboration/Online Assessment for data.



Teaching, Empowering, Leading and Learning Survey (TELL)
(http://tellkentucky.org/reports/detailed.php?stateID=KY)

Conducted in spring 2011, this survey was designed to assess whether critical teaching and learning conditions are present in schools throughout Kentucky. Among the findings:

- 81 percent of the teachers surveyed feel that they have sufficient access to instructional technology, including computers, printers, software and Internet access.
- 95 percent of the teachers feel that they have access to reliable communication technology, including phones, faxes and e-mail.
- 94 percent of the teachers surveyed feel that school leadership facilitates using data to improve student learning.
- 84 percent of the teachers surveyed believe that professional development offerings are data-driven.
- 71 percent of the teachers surveyed believe that they have sufficient training to fully utilize instructional technology.
- 62 percent of the teachers surveyed feel that they need professional development with regard to integrating technology into instruction.
- 47 percent of the teachers surveyed have had 10 clock hours or more of professional development with regard to integrating technology into instruction.
- 86 percent of the teachers surveyed believe that local assessment data are available in time to impact instructional practices.
- 92 percent of the teachers surveyed believe that they use assessment data to inform their instruction.
- 80 percent of the teachers surveyed indicated that the support that they received from their mentors with regard to using data to identify student needs was beneficial.

Supporting Guidance

Within recent years, several studies and initiatives at national and local levels have been conducted that are integral to education technology within the Commonwealth of Kentucky. Several studies yield recommendations that directly impact the strategic direction of KETS. This section contains a brief summary of each related connection with a link to the full publication. These connections collectively drive our efforts on a daily basis.

Auditor of Public Accounts
(http://apps.auditor.ky.gov/Public/Audit_Reports/Archive/2011sswak-i.pdf)

While KDE may participate in various audits throughout the year, the largest in scale, and perhaps most beneficial, is the annual statewide audit by the Kentucky Auditor of Public Accounts. The most recent report issued six findings that were related to education technology systems. The Office of KIDS spends considerable time and effort to provide complete and accurate responses to audits, ensuring all required technology controls and procedures are in effect in daily operations.

Statewide System of Support (SSoS)
(http://education.ky.gov/districts/tech/kmp/Documents/KySSoS.pdf)

This section briefly summarizes perceptions of the KDE Self-Assessment Team and additional KDE staff about strengths and areas of need in Kentucky's SSoS, as well as major themes that emerged during the two-month self-assessment process. Table 1, which is taken from the initial report, summarizes strengths and areas of need in Kentucky's current statewide system of support, based on two meetings with the KDE self-assessment team, documents provided by the team, interviews with four local educators and a February meeting with a larger number of KDE staff.

Strengths	Areas of Need
Communicating high expectations	
Establishing standards, assessment	Helping districts/schools implement standards and assessment
Data systems	Helping districts/schools use the data
Coordination with External Partners	Coordination within the agency
Curriculum and instruction tools and resources available	Helping districts/schools use curriculum and instructional resources
Funding formula	Guidance/tools to use resources for improvement; ways to determine effectiveness of funding formulae
Disseminating information, especially through designated district staff (DAC, CIO)	Ensuring information is received and understood in ALL districts/schools
Assisting/supporting/monitoring low-performing districts/schools	Assisting/supporting/monitoring ALL schools, including differentiating services
Technology support and structure	
Student support services for special education, ELL	
Leadership programs for superintendent/principal redesign	Training principals as turnaround specialists
Incentives for improvement: public recognition consequences for low performance, some funding incentives	Few incentives to work in hard-to-staff districts and schools, or to implement high-leverage strategies
	No system for ongoing evaluation and refinement of SSoS

KDE Processes
(http://education.ky.gov/districts/tech/kmp/Documents/KDEOrganizationalStructureProcessesandActivities.pdf)

These items represent major KDE processes and activities as of 2010.

KSLDS Recommendations & Transition Report
(http://education.ky.gov/districts/tech/kmp/Documents/KSLDSFinalProjectTransitionReportFINAL.doc)

The Kentucky Statewide Longitudinal Data System (KSLDS) project was originally envisioned and tasked with the primary goal of providing the means for educators to use longitudinal information to improve instruction, as well as increase accountability and reduce the burden of data reporting. KSLDS succumbed to budget cuts in the unusually dire economic situation in 2010. A more economical data portal, Open House, was begun soon after, and continues to build on the successes of the KSLDS implementation.

USDOE Office of Education Technology
(http://www.ed.gov/edblogs/technology/research/**)**

The U.S. Department of Education has many resources and studies that schools, districts and KDE might find helpful.

Unmet Need Budget

Unmet need, for purposes of the Master Plan, is defined as the funding needed to meet education technology environment provisions ranging from critical short term sustainability to strategic long term enhancement.

The Master Plan outlines the Commonwealth's five year activities related to purchasing, developing, and using technology to improve:

- teaching and the ability to meet individual students' learning needs to increase student achievement
- curriculum delivery to help meet the needs for educational equity across the state
- delivery of professional development
- administrator efficiency and productivity
- development by the private sector and acquisition by districts of technologies and applications appropriate for education

The following is a summary of changes to the current Unmet Need Budget from previous versions.

- Unit costs have been updated for the majority of line items, with the biggest changes seen in a drop in costs for computers, servers and printers.
- The Non-Discretionary ratio for Student Instructional Devices has been changed from 6:1 to 3:1 to more closely mirror the ratio that has been in place the past few years according to the Technology Readiness Report.
- Staff Professional Development line item has been moved to Discretionary.
- Wireless Access Devices line item has been moved to Non-Discretionary.
- Multiple wiring line items (i.e., Student Data, Teacher Data, Teacher Voice) have been combined into a single Network Wiring line item.
- Line items have been updated to account for changes in MUNIS moving to the cloud and Infinite Campus changes to funding.
- Line items have been removed for items no longer applicable (i.e., AD/Exchange Servers purchased by districts, MUNIS servers purchased by districts).

Click here for a copy of the new KETS Unmet Need Budget.
(http://education.ky.gov/districts/tech/kmp/Documents/20132018_KETS_Budget.pdf)

Product and Technical Standards

From the inception of KETS, the existence of architectural standards has provided Kentucky with an edge over all other states. Technology standards represent a uniform set of specifications and guidelines that are leveraged to ensure system interoperability and reduce operational complexity, therefore reducing the overall Total Cost of Ownership. All Commonwealth of Kentucky public school districts share in the benefit of each of these efficiencies due to a common set of technology standards.

The broad areas where standards are most effective and have been applied are:

- **Infrastructure**, such as network, hardware and software
- **Data,** such as for the student information and financial management systems
- **Operational Environment**, such as tools for managing the infrastructure
- **Communications,** such as e-mail, telephony and collaborative systems

Product Standards, Contracts and Authority
• Product and Technical Standards (http://education.ky.gov/districts/tech/taps/Pages/Tech-Arch-Standards.aspx)
• Contracts and Order Forms (http://education.ky.gov/districts/tech/kpur/Pages/default.aspx)
• Statutory Authority and Policy http://education.ky.gov/districts/tech/kmp/Documents/Statutory%20Authority%20and%20Policy%20Governing%20the%20KETS%20Master%20Plan.pdf