KENTUCKY DEPARTMENT OF EDUCATION

The People Side of K-12 Tech

A Human Capital Call to Action

Developed in Partnership with

BrightBytes®

Introduction

An important element in the success of any Education Technology (EdTech) program or initiative is the people that help to establish and support digital access for students, teachers, and staff. As access to digital content and resources brings with it expectations of reliability, flexibility, security, and affordability, the responsibilities placed upon our instructional and operational technology staff to ensure that the experience for all shareholders is both positive and one that supports the mission and culture of the local district continues to grow. Across the nation, and including the Commonwealth, the demand for access to digital content and subsequent growth in technology investments continues to outpace the growth rate of the human capital or staffing required. Kentucky Department of Education's (KDE) annual Digital Readiness survey continues to track and forecast an ever-growing deficit in what we describe as the “Human Capital” element of the success equation.

People + Plan + Access = Education Technology Success

Over the past five years K-12 education across Kentucky has experienced a dramatic increase in the adoption of technology enabled devices, connected services, applications, and digital experiences, but for the first time in a decade report less than 500 full-time equivalent (FTE) technology support staff. As a result, the investments in technology infrastructure and devices are not able to translate into 21st century teaching and learning at an equivalent pace.

34% of Kentucky public school districts have Digital Learning Coaches.

537,172 district-owned computer devices now exist in Kentucky Public Schools. This does not include BYOD (bring your own device), or other classroom or network-related technology components.

Student to Computer Ratio: 1.42:1

With a growing overall student to computer ratio across Kentucky K-12, 66 districts now have an established 1:1 initiative.

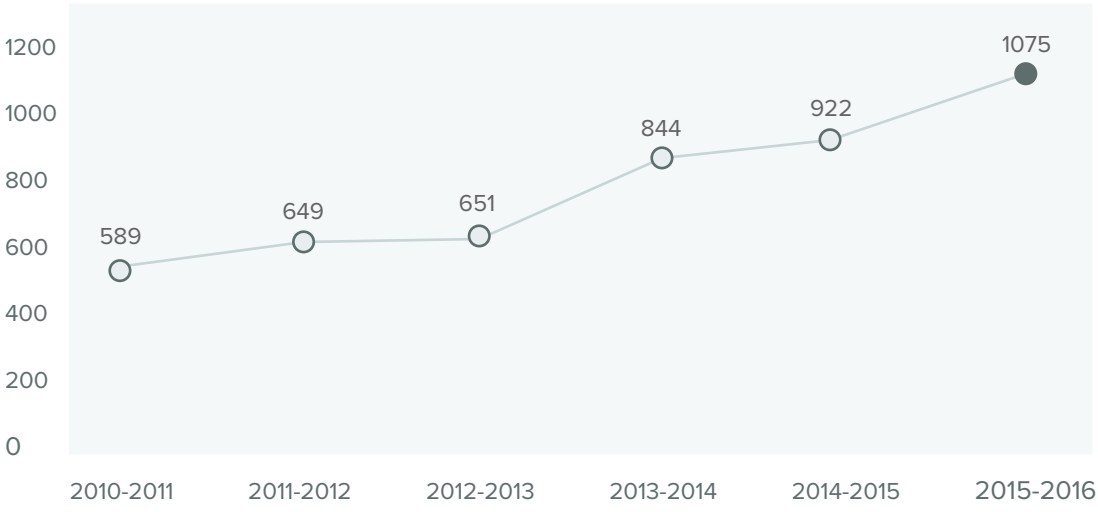
22% of CIO time is reported as spent on activities outside those that are technology related.

53% of districts have STLP students assisting with technology leadership, services, support, and training.

Technician to Device Ratio: 1:1,078

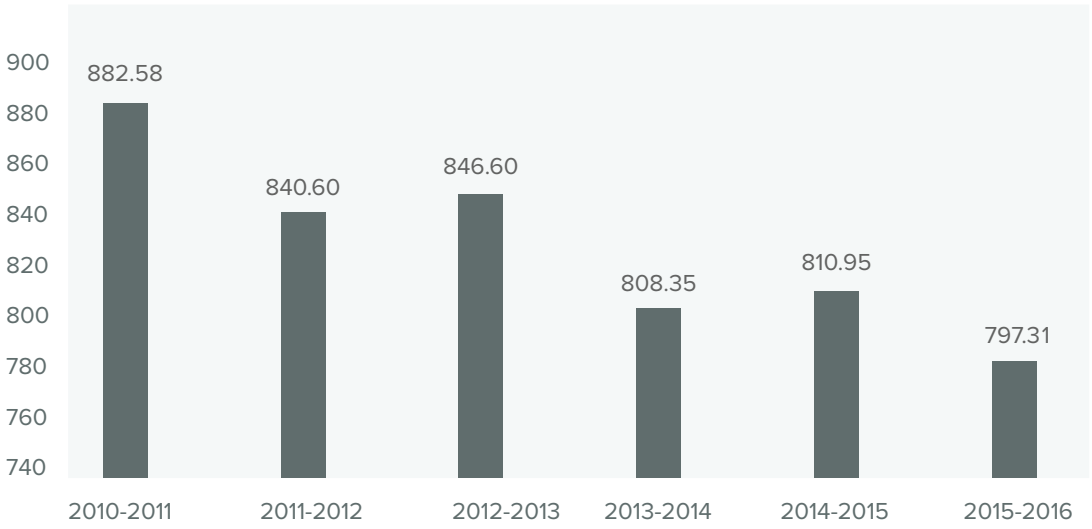
Kentucky K-12 has experienced a 100% growth rate in the total number of end-user devices since 2007, but an overall decline in the number of technology support staff (498 FTEs).

Device to Support Staff Ratio



Technical & Integration Support

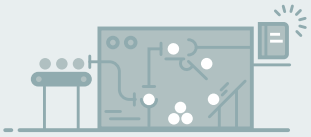
(FULL TIME EQUIVALENT) (ED TECH LEADER + TECHNICIAN + TIS/TRT)



This document serves to outline the critical leadership and staffing functions needed to address the wide-ranging and ever-evolving nature of Education Technology.

Six Pillars of Education Technology Leadership, Time, and Attention

The scope of responsibility for effective EdTech leadership is summarized in the graphic below. Each of the six focus areas outlined represent a key pillar that should be formally addressed within the leadership structure of any organization—private or public— to maximize the impact of technology investments.



1

Operations

2

Instructional Alignment & Integration

3

Financial, Ethical, Policy & Leadership

4

Data & Information Management, Security & Strategies

5

Strategic Planning

6

Emerging Technology & Innovation

Guiding Questions for School & District Leaders

To better outline the organizational need for adequate technology leadership and staffing (leadership and technical skills), the following questions have been formulated to walk district leaders through a variety of scenarios and expectations which need to be addressed on a regular basis to maximize the six key pillars of EdTech leadership, time, and attention.

1. **Operations**
   Do you expect that all technology for students, teachers, and staff is reliable, and when it's not, do you expect high-quality and quick resolution?

2. **Instructional Alignment & Integration**
   Do you expect that the technology provided to both teachers and students supports the district's instructional strategy, and that teachers and students maximize the investment?

3. **Financial, Ethical, Policy & Leadership**
   Do you expect that all technology funding opportunities at the local, state, and federal level are fully maximized and leveraged? Do you expect that technology expenditures align with district priorities and budgetary constraints? Do you expect that all local, state, and federal laws and regulations in regards to Education Technology are adhered to?

4. **Data Management and Information Strategies**
   Do you expect that student, teacher and shareholder information is respected and secure, and that adequate processes are in place to monitor and address any breaches of sensitive, top-secret, or confidential information? Do you expect that data is accurate and presented in a manner to both drive and support decision making?

5. **Strategic Planning**
   Does your district expect education technology to support new strategies being implemented to improve results or change current practices? Is your district's EdTech leader engaged and involved in all design and planning work with district and school leadership?

6. **Emerging Technology & Innovation**
   Are you preparing for education technology to keep pace with changing district needs? Do you expect your EdTech leader to have a growth mindset with industry leading technology that is shaping our world and global economy?

Foundational Principles

LEADERSHIP SKILLS VS. TECHNICAL SKILLS

A need for both... Kentucky's models of best practices for successful EdTech programs and initiatives demonstrates an organizational model which blends strong visionary leadership with high-quality technical skills. Recognizing the key differences between the leadership and technical skills required, and more importantly the reality that these are often two different types of people, helps to establish a clear separation of duties and a more efficient overall approach. Typically, the strategy, financial, policy, alignment, legal, and management skills are targeted at EdTech leaders, while the purely technical (break/fix and install), and architectural skills are reserved for purely technical positions.

WHAT IS EDUCATION TECHNOLOGY?

Technology is everywhere... Education technology is anything that:

1. Has electricity flowing through it (plugs into something), and/or
2. Connects to the Internet or any network by a wire or wireless, and/or
3. Has data, information, voice, sound, images or video created, entered, displayed, stored or flowing back and forth, and/or
4. Involves digital (i.e., learning/teaching, training/PD, decision making/analysis, communications, reporting, or online testing)

WHAT IS AN ENTERPRISE EDUCATION TECHNOLOGY SOLUTION?

Everybody depends on it... KDE defines an enterprise education technology solution as any technology enabled system that:

1. Has more than one school or department using it
2. Is a pilot and has great potential to be used by more than one school or department after the pilot
3. Is used by more than 10 school districts
4. Is a data source that will be used by one of our big data systems, and/or
5. Is very high profile/mission critical

An education technology solution is typically designed and implemented to handle scale, to ensure it is reliable, easy to use, and to support a great customer experience by the average person. Additionally, an enterprise EdTech solution is also acknowledged by the planning and funding for sustainability year over year.

WHAT IS TOTAL COST OF OWNERSHIP?

It's not a one time purchase... Typically the initial purchase price to build or buy a technology-enabled product/service only represents 20% of its true cost over its life. The other 80% of the cost is represented by people, software costs, hardware costs, ongoing licensing costs, ongoing training, conversion, telephonic/onsite repair/break fix, ongoing maintenance, and incremental upgrades. Additional costs show up in the enterprise systems relationship and impact other KY K-12 platforms and systems. This is generally represented in change management.

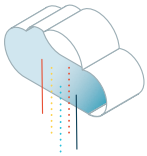
So, How Many People Do I Need?

There is no magic formula or equation for this vital question. Perhaps the most important task is to make sure leaders are actually asking the question. Many factors play into the right answer for your district, schools, and classrooms.

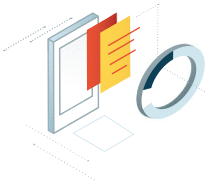
A couple factors, or second level questions, to consider are: Are you are getting ready to launch a big initiative integrating technology and learning? Do you have a high skill level in your EdTech staff team for automation of general or operational tasks? Both answers may reveal scenarios resulting in the need for more or less staffing. In other words, the amount of people needed during initial implementation of a new project may be different than the amount of people needed for ongoing operations. Those same people may be outsourced or up-sourced with a partner (vendors, cooperatives, higher ed, etc.). Based on outside research and analysis of Kentucky school districts, the following is a sample that may prove to be helpful when highlighting your EdTech leadership and team. With a team approach, these roles could be realized in any number of flexible staffing plans or models (as well as strategic funding models).

1 CIO + 1 DATA LEADER + 1 CTO + 1/800 Devices TECH + 1/1.5K ADA DLC = _____

Influencers and Drivers



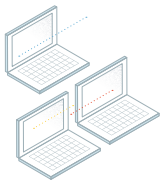
Cloud / Shared Services



Big Projects / Implementations

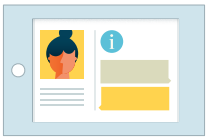
(e.g. new projects or implementations vs. daily operations)

Age of Devices / Technology



Standardization

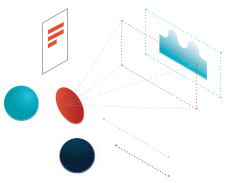
(e.g. standardization of device type, LMS, etc)



STLP & Student Help Desk

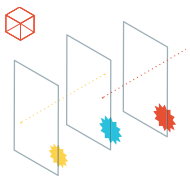
(e.g. students support or lead the help desk / tech support)

**55% of KY districts leverage STLP students for help / tech desk support*



Systems & Structures

(e.g. establish systems and structures to leverage teacher leadership)

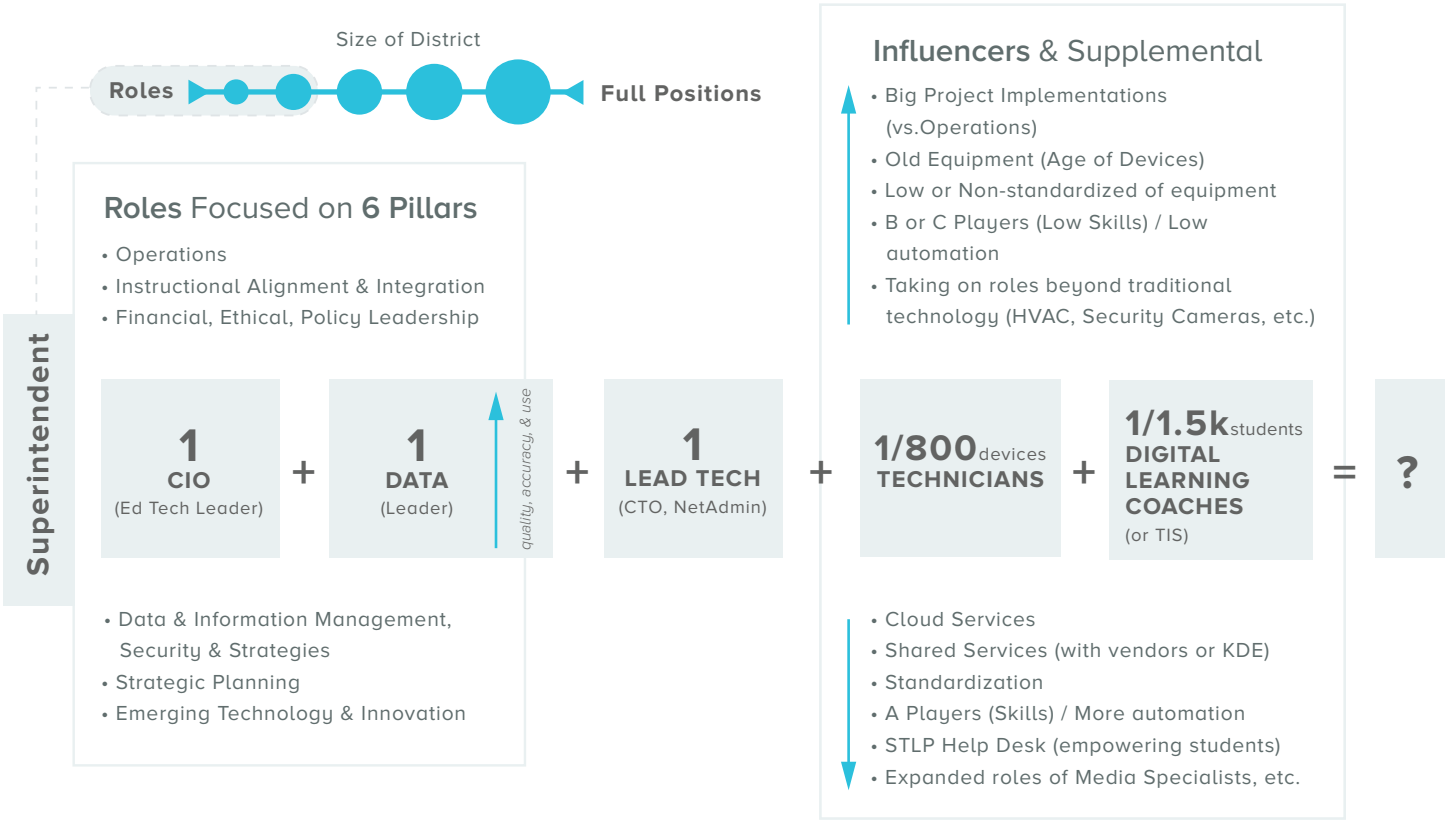


Library Media Specialist

(e.g. Library Media Specialists serve as Digital Learning Coaches)

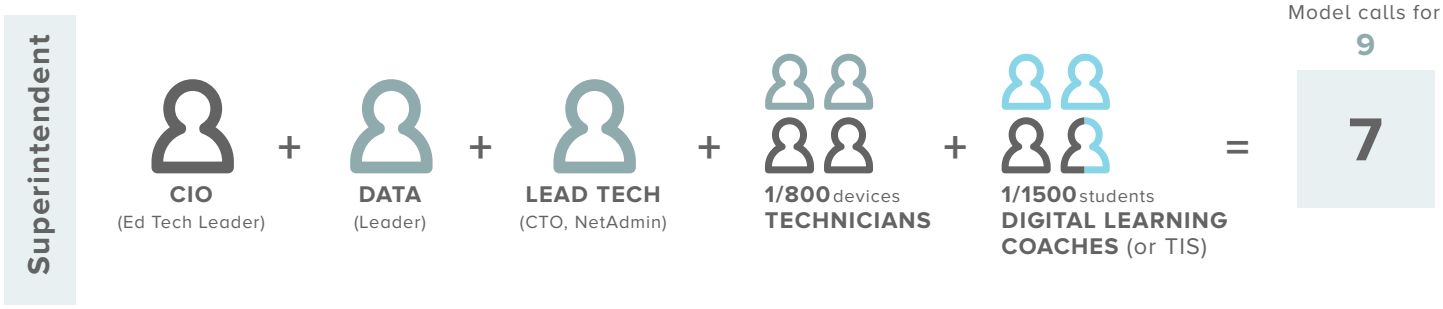
Human Capital Model

The People Side of Ed Tech

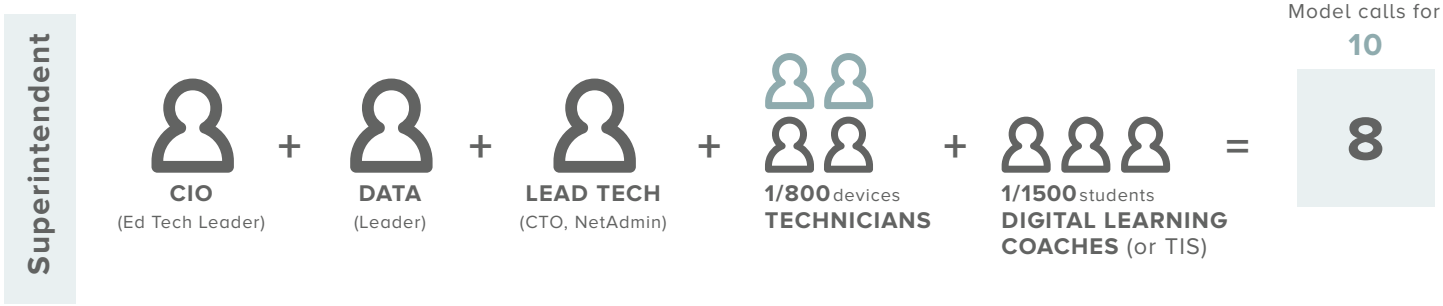


Model Examples

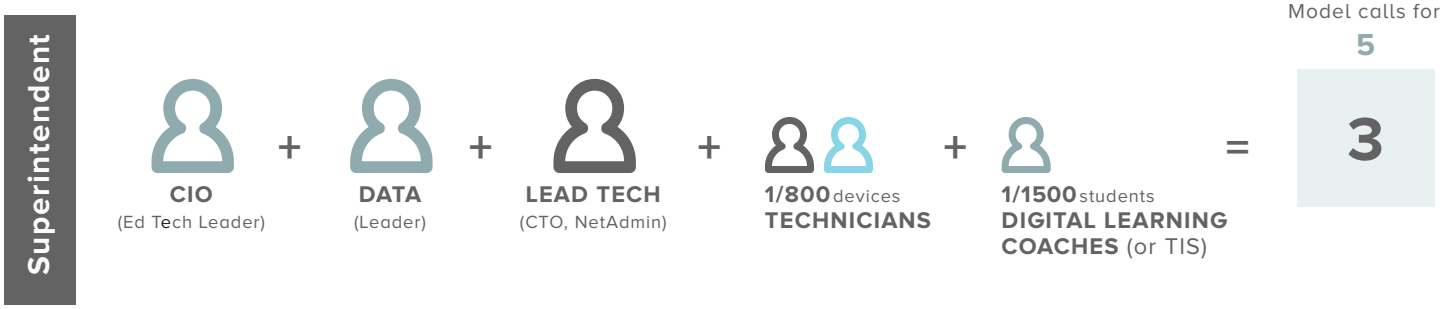
District A 2,100 ada | 3,215 devices



District B 4,500 ada | 3,415 devices



District C 1,200 ada | 1,000 devices



ACTUAL/ CURRENT TO FIT MODEL SURPASSING MODEL

Connected Research

Educause 2017 IT issues and Strategic Technologies Report Key Points (resource)

- Understanding that the challenge is shifting from high operations to high services. 48% of current staff are at high risk of leaving (up from 32%). Only 26% of CIOs were previous CIOs (EdTech leaders are being hired from other jobs).

- Organizations must plan for constant, and perhaps, drastic change in workforce requirements and prepare to keep those resources aligned with evolving strategies. Focus on retraining and retaining current staff. Managers who can develop and foster a collaborative and congenial workplace are the superpower of a stable, high-performing organization. They should be identified, developed, and nurtured.

- While technology leadership is getting more strategic and education focused, the technical skillsets that are in short supply (and in high demand) are: developers, security specialists, and system administrators.

STAFFING NEEDS:

- Analysis and modeling skills, data visualization and reporting, and user support activities. 80% of institutions have 2-8 FTEs devoted to analytics (median = 4 FTEs).

- Digital learning course designers and professional development staff to help faculty. Over 6 in 10 institutions need more staff in these areas. Institutions have less than half the staff they need to deliver digital learning optimally.

Gartner Research Key Points from 3 2015-2016 Research Publications

KEY INDUSTRY MEASURES - EDUCATION ANALYSIS (resource):

The 2015 education vertical industry average EdTech spending as a percent of operating expense is 5.6%, up from 5.2% in 2014; The 2015 education vertical industry average EdTech spending per employee is $7,894, up from $6,498 in 2014. EdTech Full Time Equivalents (FTE) as a percent of employees is down to 4.7%.

> *"Understanding the relative level of IT staff dedicated to supporting the business can also assist in identifying whether the staff size is appropriate. This should be considered within the context of the overall enterprise sourcing strategy and future-state objectives. Variables to consider in tandem with this metric include IT staffing distribution, contract versus insourced FTEs, and IT outsourcing as a percent of IT spending, as well as the enterprise sourcing strategy. — Does the total employee count accurately represent the organization's workforce that is supported by IT? Do you have the ability to track the total number of internal users supported by IT?"*

JUSTIFY STAFFING REQUIREMENTS (resource):

Leaders trying to optimize IT operations feel they do not have the staffing to deliver according to expectations, yet struggle to justify staffing requirements. Infrastructure and operations (I&O) leaders find that justifications to add staff, or even retain existing staff, require resolving complex relationships between costs, activities, and staffing levels. Recommendations:

- Create compelling staffing justifications using a customized, fact-based approach that connects staffing levels to business performance
- Create a staffing model using the appropriate I&O productivity and efficiency metrics
- Benchmark I&O staffing against averages for similarly sized environments
- Explain I&O staffing requirements to IT and business leaders in terms of business value

USE BIG DATA TO FUEL BIG CHANGE IN K-12 EDUCATION :

The expanding ecosystem for educational data will pressure K-12 CIOs to access, organize, and distill disparate data in a way that enables educators to find, interpret, and help the data create meaningful impact in the classroom. The exponential growth of data volume, velocity and variety in K-12 organizations is creating an urgent need for CIOs to build broader strategies and vision to meet it. The scattering of relevant data is impacting variety, security, and privacy, exacerbating the K-12 CIO's problem of providing a comprehensive view of relevant data. The increasing demand on CIOs for rapidly actionable analytics on a variety of learning and administrative data without the means to deliver it leads to missed opportunities in the classroom and beyond. Because K-12 organizations are often ill-prepared to evaluate the quality and usefulness of this inbound data, CIOs are missing opportunities to help turn data into meaningful action.

Virginia Department of Education 2008 Study Key Points

(resource)

- Virginia General Assembly authorized and funded two new education positions: instructional technology resource teachers (ITRT) and technology support staff. This action represented a continued commitment to integrating technology into K-12 instruction.

- As a result, these positions now exist in all 132 Virginia school divisions, and more than $500 million has been spent to support educational technology infrastructure. All Virginia school divisions are moving toward the requirement of employing one ITRT and one technology support staff member per 1,000 students. Based on a 2006 survey (Hooker, 2006), 83 percent had met the required ratio.

- Research found that “some ITRTs had an advantage of supportive leadership in a school culture that was open to change” (p. 214). This suggests ITRT should include the topic of “leading reform and change efforts” as part of their professional development efforts with administrators. Fostering a better understanding of technology integration and the importance of reform could improve “communication and collaboration between the ITRT and their school level leaders, embracing the concept of shared leadership and teamwork.”

Kentucky
Department of Education

PILLAR 1 Operations
Featuring Erin Waggoner, Jessamine County Schools

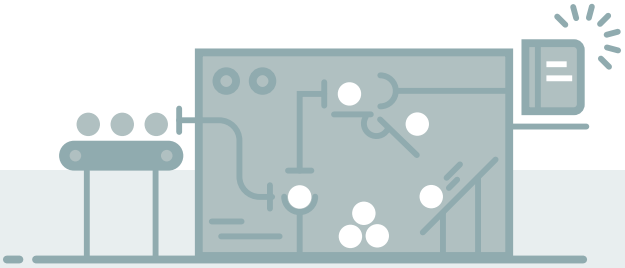
PILLAR 2 Instructional Alignment & Integration
Featuring Susan Taylor, Boyle County Schools

PILLAR 3 Financial, Ethical, Policy & Leadership
Featuring Bob Moore, Fayette County Schools

PILLAR 4 Data Management & Information Strategies
Featuring Nikkol Bauer, Henry County Schools

PILLAR 5 Strategic Planning
Featuring Dr. Matthew Constant, Owensboro Public Schools

PILLAR 6 Emerging Technology & Innovation
Featuring Courtney DeRossett, Floyd County Schools



PILLAR 1

Operations

Do you expect that all technology for students, teachers, and staff is reliable, and when it's not, do you expect high-quality and quick resolution?

Explanation

Today's end-user demands that all technology devices, access, and applications– both at home and at school– are available 100% of the time. Inevitably, technology systems fail, and when (not if) they do, staff with specific technology skill sets are needed to ensure that these systems are restored in a timely manner.

Furthermore, the same concepts of preventative maintenance, upkeep, and replacement targeted at buses and buildings should also be applied to all technology infrastructure and devices. It's important to recognize the skills necessary to manage technology operations on a daily basis are very different from the skills used to deploy, support, and repair technology. However, in both cases, there must be a sense of urgency, customer focus, and understanding of the human and classroom impact of technical malfunctions. In the same way we've invested in the proper maintenance and efficiency of our buses and buildings, we need to invest in our technology. We must ensure that it is maintained and functioning as intended, and that we have people in place to manage our technology deployment, support, and repair.

DATA STORY IN KENTUCKY

74% more devices

700:1

There has been a 74% increase in the number of computer devices per technician in the past 5 years. With nearly 100 additional computer devices for each technician in the past school year, the overall scope of just end-user device support now stands at almost 700:1. This ratio does not include the diverse magnitude of technology components behind the scenes that actually enable access to information (networks, applications, printers, projectors, security systems, etc).

49% of teachers report high quality support for technology problems that disrupt instruction.

42% of teachers report high quality support for hardware repair.

45% of teachers report that they get same day support for problems disrupting instruction.

24% of teachers report that they get same day support for hardware repair and 44% of teachers report that they get support for hardware repair within 24 hours.

Best Practices & Strategies Found in Kentucky

When it comes to operations, district leaders, such as the CTO or CIO, shouldn't be doing the day-to-day work. The district leaders should be setting up a system and then have the right people in place to help implement that system and to execute the day-to-day work. Jessamine County Schools is one example of a district that has put a successful system in place to ensure that its technology is reliable, and when it's not, there is high quality and quick resolution.

> *In 2010, Jessamine County School's device to technician ration was 177:1. Today, their device to technician ration is 531:1. The district has 8,000 students and 8,000 devices, whereas by comparison, in 2006 the district had 6,500 students and less than 1,900 devices. Jessamine County Schools has 18 people on its technology staff- three central office staff members and one person at each school who provides onsite technical support. A decade ago, Jessamine County Schools had 12 full time technology resource teachers (one per school).*

A Decade Ago

6,500 STUDENTS

1,900 DEVICES

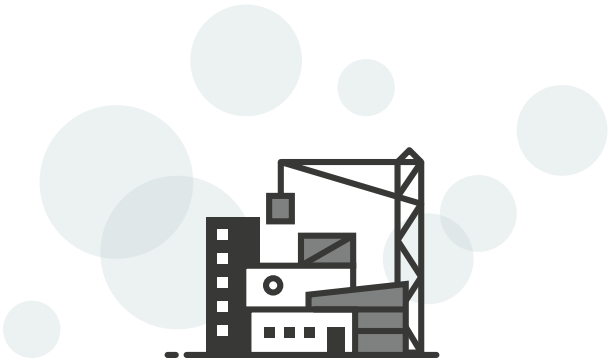
12 ON-SITE TECHNICAL SUPPORT

Today

8,000 STUDENTS

8,000 DEVICES

18 ON-SITE TECHNICAL SUPPORT



Today, all Jessamine County's site-based support positions are held by classified staff hired for six hours per day to provide site level technical support. These positions typically offer entry level pay, and thus it can be hard to recruit and retain staff with a high level of technical skills necessary for the position. Likewise, there is often high turnover in this position. An increase in devices and a decrease in support is the reality for many school districts across Kentucky. However, while still lacking in some of the necessary human capital aspects, Jessamine County Schools has put a strong system in place and has worked creatively to staff the district despite some budget shortfalls for human capital.

THE SOLUTION

Jessamine County Schools has a central office technical staff consisting of two senior technology engineers in addition to the Director of Technology, Erin Waggoner. Ms. Waggoner attributes the success of her two senior technology engineers to their ability to address the technical component of their job as well as understand the human component. For example, these two senior engineers spend time at school sites talking to teachers and listening to the impact that technology malfunctions have on classroom learning. They've developed an understanding of how things like a one-minute delay when turning on a device may not sound like an issue, but can have a significantly negative impact on a teacher and their classroom instructional time. The technology team's customer focus and sense of urgency has been crucial and led them to think creatively about how to provide quick and effective support for each site despite experiencing funding cuts that forced the elimination of their technology resource teacher position. One key strategy has been to leverage students and teachers for school site support.

Director of Technology, Erin Waggoner, and her two senior engineers knew that they couldn't do all of the day-to-day operations work on their own, so they filled their staffing shortfall by using teachers and students as resources to provide direct support at the school level.

The district technology office has taken the initiative to help solve this personnel gap by tapping into students' knowledge and skill sets for support. They've created a program where students are hired by the district and paid to provide technical support. The district holds high expectations for these students. Students must apply for the position as they would any other job, take the appropriate classes at Jessamine Career and Technology Center, and act responsibly. These students are taught both technical skills, such as how to hang access points, setup Chromebooks, and rewire a wiring closet, as well as soft skills, such as how to work with a sense of urgency and customer focus and de-escalate situations when someone gets upset due to a technical malfunction. Students report directly to one of the district's senior technical engineers and work at both a central location and school sites to provide support to school staff, including the classified technical support person. The program has been an all around win. It has saved the district thousands and thousands of dollars, and has provided students with important skills for college and career.

The senior technology engineers and the student technical support team have also been working to empower teachers to take a leadership role and learn basic technical skills to fill the school site support gap. In many cases, the roles have reversed and the students are teaching their teachers. The district has also provided Google certification opportunities for teachers at each site and plans to expand this program each year. The Google certified teachers have taken on leadership positions at their schools and work with other teachers in need of support.

Erin Waggoner identifies three critical elements necessary in order to create and maintain a system where all technology for students, teachers, and staff is reliable, and when it's not, there is a high quality and quick resolution.

1. **The EdTech leader needs to have a seat at the leadership table.**
   In order to best support the district, the CTO needs to know about initiatives and programs before they get rolled out and have input during pre-planning and implementation. This prevents leaders from being pulled in after a purchase or mid-way through an implementation, to navigate through unforeseen challenges.

2. **The EdTech leader needs to build a system, not do the day-to-day work themselves.**
   It's important that the district leadership build a system that ensures timely and high quality support and has the budget to hire a team to implement this system and provide the day-to-day work.

3. **There needs to be a focus on customer support from all positions within the district. The technical support team needs to feel a sense of urgency with their work.**
   It's crucial that technical support staff understands the impact that their work has on the staff, students, and classrooms they support. Just like teachers, technical support staff need their work to be recognized, rewarded, and held to high expectations.

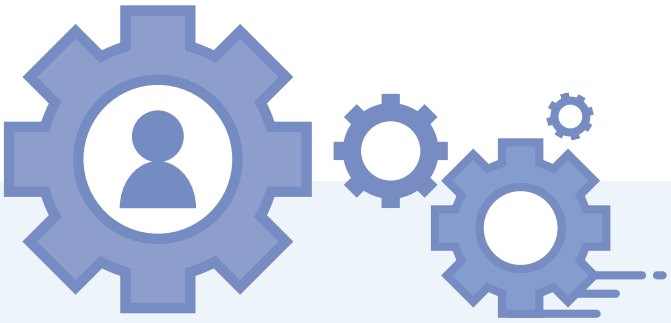
Conclusion

An EdTech Leader's job is to build a system to provide the day-to-day support necessary to ensure all technology is reliable, and when it's not, there is a quick resolution. The EdTech Leader leads a team to implement this system and to create a sense of urgency within this team to provide high quality and timely support, in order to protect valuable instructional time and minimize or eliminate technology driven interruptions. The EdTech Leader must instill this same sense of urgency across their team, especially among technical support staff who often are not trained teachers and are most commonly responding to technology related support and repair requests.

The support to implement this system can be provided through a variety of ways, such as student technology support teams and "genius bars," a designated IT person or team focused on maintenance and repair, or a technology integration specialist (TIS) who can straddle both the technology instruction and technical support components. There needs to be a system and expectations put in place by the EdTech Leader and a budget to hire support staff dedicated to preventative maintenance, upkeep, and replacement. Support staff must be available quickly to respond to technical problems at the site because the EdTech Leader cannot do this alone.

Roles/Expertise Needed

- Technicians
- STLP Help Desks
- External Partners



PILLAR 2

Instructional Alignment & Integration

Do you expect that the technology provided to both teachers and students supports the district's instructional strategy, and that teachers and students maximize the investment?

Explanation

Technology that does not meet the instructional needs of classroom teachers often fails to be maximized as a local investment. Studies have shown that this is in large part due to the fact that:

- It does not engage students or enhance learning experiences
- It is viewed as prohibitive or distractive
- It does not align with the local district's vision

The skills required for success in college and career are becoming increasingly complex, and schools must rise to meet new demands. To meet these new demands, teachers must not only have the devices and infrastructure necessary for 21st century teaching and learning, but also the skills, time, tools, and 3Ps needed to seamlessly integrate technology into instruction. Many teachers are not prepared, or comfortable, with the strategies necessary to effectively integrate education technology in a meaningful manner. Educators must be able to leverage technology tools to develop the 21st century skills expected of students (Delaney, 2011).

The new skill sets necessary for true instructional focus are vastly different from the traditional School Technology Coordinator (STC) model, which placed more emphasis on technology break/fix repair activities than on instructional integration. Additionally, the technology leadership component requires CIOs to tightly partner with district instructional leadership (Instructional Supervisors, Principals, Chief Academic Officers) to ensure that all technology deployed aligns with the district and school's instructional focus and academic needs.

DATA STORY IN KENTUCKY

35% of school districts (60 districts) have hired at least one dedicated Digital Learning Coach or EdTech Integration Specialist. 13% of school districts (22 districts) have hired multiple Digital Learning Coaches. This skilled area of just-in-time professional learning for teachers continues to decrease with a 32% reduction in force in the past 5 years.

28% of teachers report that it takes a week or longer to get support for instructional technology planning.

36% of teachers report high quality support for instructional technology planning.

35% of teachers report spending 9 hours or more per year participating in school-sponsored PD, of which 31% of teachers report it is high quality and 45% of teachers report it is average.

Best Practices & Strategies Found in Kentucky

Boyle County Schools is a great example of how one district has set a clear expectation that technology must support the district's instructional strategy. Establishing this as an essential requirement across the district and schools was a first and critical step. Developing a plan for how to achieve this goal has been their ongoing focus.

The first step in their process was to outline a clear vision for the district's instructional goals and develop a strategic plan. The district worked collaboratively to develop their outline. Various leadership positions, from both the instructional and technology sides, contributed to the overall vision. Once this step was complete, the challenge became how to achieve these goals as a district with participation from all teachers and principals.

> *"Our students are digital natives, but they aren't digital learners yet. The only way we can get our students to be digital learners is by providing more support for teachers on how to teach with technology."*
>
> **SUSAN TAYLOR**
> CIO
> Boyle County Schools

As the district began to roll out its instructional vision, leaders quickly realized that they needed to provide professional development and support to their teachers on how to incorporate technology into instruction and support instructional goals. For Boyle County Schools, it's never been about technology; it's been about defining instructional goals, and then finding the right tools to support them. As the district's professional development and support needs for its teachers became clear, they also realized a need to spend more time with teachers at schools and in classrooms. They needed to observe teachers' instructional practices with technology, be onsite to provide differentiated support for teachers, and meet teachers where they are, rather than waiting for teachers to ask for help.

Boyle County Schools EdTech Leader and CIO, Susan Taylor, realized she could not do all of this on her own, so she hired support and leveraged existing district resources. Taylor established three key support structures to ensure strong instructional alignment and effective integration.

1. Boyle County Schools hired a Technology Instructional Specialist (TIS), Stephanie Wade, who spends time at each school site supporting school staff, organizing professional development, conducting classroom observations, offering valuable strategies or resources, and helping teachers with instructional planning and lesson design.
2. Boyle County Schools identified teacher instructional technology leaders at each school site to provide extra support at the site level. These individuals receive stipends for their time and have the opportunity to receive extra training or certification, for example, training to become Google certified educators.
3. Boyle County Schools has made it a routine that the district administrative team (EdTech leadership and the Superintendent's team) conduct classroom visits throughout the year to maintain a pulse on classroom instruction. Within the first four weeks of school, they conducted 1,400 walkthroughs. The walkthroughs are not evaluative, instead the purpose and focus is to provide teachers with formative feedback and highlight positive instructional strategies observed.

Susan Taylor accredits a lot of the district's progress towards achieving their instructional vision to getting everyone on board and setting clear expectations for each role in the district. Likewise, she has focused on putting the right support systems in place for people to achieve those expectations. Taylor shares how crucial it has been for her, as the EdTech Leader, and the Superintendent to work closely together as they try new things, explore different approaches, and learn from their mistakes along the way. District leaders have worked hard to establish a clear set of expectations, common instructional goals, and build a culture that supports risk taking and learning along the way. This approach wouldn't work without instructional support at each site to enable that learning.

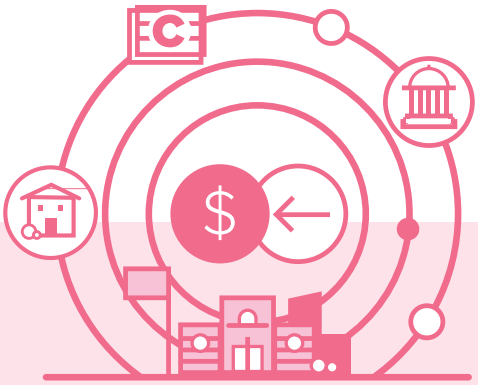
Conclusion

Overall, Kentucky's data shows a strong commitment to the potential of technology and an eagerness to experiment. At the same time, it also mirrors the research findings which highlight the critical need for strong professional learning opportunities and ongoing support to ensure instructional alignment and promote effective integration. Long-term professional development that models the type of learning expected of students is necessary in order for educators to leverage technology tools that develop 21st century skills (Delaney, 2011).

Now, more than ever, Kentucky school districts are seeking and exploring creative ways to support teachers around purposeful and effective integration of technology that truly transform the learning environment. This involves ensuring that each district and school is equipped with support staff, such as TIS and Digital Learning Coordinators, and leaders that can help to turn beliefs into practices, policies, and high quality instructional support. A targeted focus on improving teaching and learning, as well as the school environment, will help Kentucky achieve meaningful technology integration that positively impacts student learning.

Roles/Expertise Needed

- Digital Learning Coaches
- Professional Development
- Library Media Specialists



PILLAR 3

Financial, Ethical & Policy Leadership

Do you expect that all technology funding opportunities at the local, state, and federal level are fully maximized and leveraged? Do you expect that technology expenditures align with district priorities and budgetary constraints? Do you expect that all local, state, and federal laws and regulations in regards to Education Technology are adhered to?

Explanation

If properly funded and effectively managed, digital learning has the power to create enormous opportunities for school districts to teach students in more effective and economical ways (Goen, 2014). Successful technology leaders know how to manage and leverage local, state, and federal funding opportunities for technology initiatives, as well as plan for, and ensure, effective implementation.

The ability to maximize the potential of local contribution and the variety of federal programs such as eRate, Title I, Title II, and IDEA, in addition to the KETS Offers of Assistance, often dictates both the pace in which districts can remain current and relevant with technology, and the quality and quantity of technology staff necessary to support the investment. As outlined in the KETS Master Plan for Education Technology, multiple funding sources are required to sustain and incrementally replace existing technology, and deploy new and emerging technology on a limited basis. Additionally, these diverse funding sources for technology dictate that Education Technology Leaders (CIOs/DTCs) need to partner tightly with district leadership (superintendents, finance officers, principals, etc.); this is not only to engage in all strategic planning activities, which may have a technology component involved, but also to integrate with budget planning activities and all technology expenditures.

DATA STORY IN KENTUCKY

$226/

$40/

According to the Master Plan, the annual unmet need per student currently stands at $261 for baseline components. Per the annual Technology Activity Report (TAR), districts spend on average $226 per student, and of that approximately $40 is comprised of KETS funds (State Offer of Assistance + Local District Match).

Best Practices & Strategies Found in Kentucky

It's about kids.
FAYETTE COUNTY PUBLIC SCHOOLS

Bob Moore, Chief Information Officer at Fayette County Schools, has a very clear strategy and process for the financial aspect of his education technology plan. A key aspect of Bob Moore's approach is to ensure, first and foremost, that technology supports the district's strategic plan. He refers to the district's strategic plan before making any technology and spending decisions. He always asks the following three questions when making a decision, including a technology related purchase decision:

1. How does this affect the students?
2. How does this affect the teachers?
3. How does this affect everyone else?

Bob Moore prioritizes questions one and two. He is okay making occasional decisions that have a positive impact on students and teachers, but not everyone else (administrators, community members, personnel, etc.) if the impact on students and teachers is so great that it can't be ignored.

In addition to these three questions, Bob Moore also has developed three standards to evaluate technology purchasing decisions.

1. **Availability**
   Where do teachers need this technology to work? Is the technology available where the teachers need to teach? (This doesn't just mean in a classroom.) What do I need to do to make the technology work where teachers need it?

2. **Usability**
   Like the availability component, the usability piece is critical to drive successful technology decisions. For example, is the technology easy to use? Does the technology support the district's instructional plan? It doesn't matter if there are thirty computers in a classroom. If the computers are not usable, they are not available.

3. **Efficiency**
   The efficiency piece is more broad than availability and usability. Efficiency covers infrastructure, personnel, and technology support. It's important to make sure that the district is spending money in the right places and being efficient with the use of its people and infrastructures. It's also critical that the people and infrastructure piece of technology is keeping pace with how the district needs to support schools.

This process has helped Bob Moore shift the responsibility of school infrastructure support to the district. To do this, he has made some major changes to the district's budget, but did so because it has a positive impact on the district's students and teachers. The district now budgets as much as possible to support and replace classroom infrastructure so that schools can focus on innovation and meeting student needs.

BOB MOORE'S PROCESS FOR EDTECH FUNDING

- Prioritize Needs
- Build Capacity
- Standardize Purchasing
- Incentivize Behavior
- Impact Instruction
- Identify Costs and Funding
- Evaluate and Repeat

Conclusion

It's important that districts use available technology meaningfully and prioritize spending to fill critical gaps. District CIOs must leverage a variety of funding sources and work collaboratively with leadership across the district. To successfully achieve this goal, it is crucial that district leaders first define the role of technology for student learning. Leaders must ask:

- How will this technology resource or tool further or accelerate students' learning?
- How does this technology resource or tool align to the district or school's vision and goals?
- Does the district have the support available and in place to ensure effective implementation of this technology resource or tool?

When making important, and expensive, decisions about technology for schools, leaders must examine the fine print and analyze the total cost. The availability of technology in schools is not enough to guarantee improved student outcomes. Educators must make smart decisions about the type of technology made available, taking into consideration the desired learning outcomes, and the total cost of each technology purchase (i.e. professional development, maintenance, etc.). Examining all associated costs of a technology implementation, as well as the potential savings, and developing a comprehensive implementation plan to support all schools across the district, will alleviate some of the stress that accompanies a widespread tech rollout.

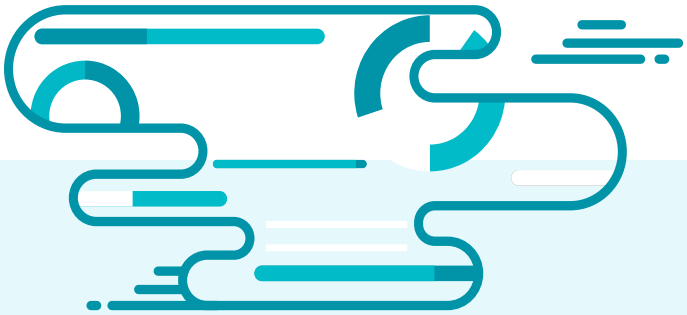
Before embarking on a large-scale technology implementation, district leaders should consider taking the time to examine the following areas:

- Purpose
- Budget
- Infrastructure
- Training
- School Buy-In

Addressing these areas will lead to a more successful integration of technology in the classroom.

Roles/Expertise Needed

The CIO plays a critical role collaborating with individuals from finance, risk management, and legal counsel, as well as instructional leadership, to ensure fiscally responsible, ethical, and responsible technology decisions and policies.



PILLAR 4

Data Management & Information Strategies

Do you expect that student, teacher, and shareholder information is respected and secure, and that adequate processes are in place to monitor and address any breaches of sensitive, top-secret, or confidential information? Do you expect that data is accurate and presented in a manner to both drive and support decision making?

Explanation

The widespread availability of data across education enables stakeholders to analyze qualitative learning measures through a lens of quantitative data results. With trackable progress and increased accountability throughout education, there is a growing urgency to safely use data to truly impact student learning. However, with the increased access to data and information, there are infinite ways in which ineffective data management and unsuccessful execution can hinder progress. In addition to ensuring readability, data and personal information must be protected and secure. It is critical that complete, accurate data sets within a secure platform provide an educative experience. Teaching students about digital citizenship prepares students to be responsible global citizens that know how to use technology strategically for this purpose (Ribble, 2012).

DATA STORY IN KENTUCKY

84% of teachers and 83% of parents know about the legal use of web content.

38% of teachers spend 3 hours or less per year teaching student about legally using web content.

89% of teachers report that their school or district provides a system for entering and viewing attendance records at school and at home.

91% of teachers report that their school or district provides a system for entering and viewing grades at school and at home.

Best Practices & Strategies Found in Kentucky

HENRY COUNTY PUBLIC SCHOOLS

Across all districts in the Kentucky, state leaders have seen an improvement of high quality, accurate data being used to inform decisions, meet state compliance, and drive change. Leaders from both the school and district level have committed to adopting accurate and secure data practices to ensure that as data rolls up, it maintains its quality. This influx of high quality data has presented district leaders with a challenging task of balancing access to rich data and technology with maintaining security and privacy of students and staff.

Henry County Schools is one example of a Kentucky district focusing on both the usability and safety of data across the district. Nikkol Bauer, Chief Information Officer at Henry County, has dedicated her efforts into building a culture of safe and secure practices at the district level and site levels. Henry County has established a district wide belief that it is every stakeholders' responsibility to ensure that data is secure and accurate, and when a problem does occur, stakeholders are able to report to an individual with whole district context to address any serious issues.

To ensure staff understands data security, and how to reach out for necessary guidance, the district makes certain that everyone is properly trained on digital safety and security and data management. The team is very committed to providing accurate information and timely updates on new district policies and statewide legislations to ensure widespread awareness of the district's data procedures and expectations. Their unique approach includes using mandatory staff events to host trainings on data privacy and offering virtual sessions on specific data usage topics.

> *As Bauer and her team have worked with site-level leaders, they learned that principals often express great concern about the line between personal devices and email accounts and school responsibilities. To help address this, the team has worked across the district to develop the policies that define responsibilities of school staff and students with both school and personal devices.*

Bauer has also created a comprehensive presentation that outlines key practices very clearly. The presentation guides staff through a checklist of areas like digital citizenship, password protection, locking computers, and how to respond to digital incidents. It is important that nothing is lost in the shuffle of a new school year or staff turnover, so the district provides ongoing training and sends reminders to principals to raise awareness at the site level and Bauer periodically sends out communication about areas within the resource.

Information security and data privacy have escalated into critical areas of concern over the last several years, as evidenced by the global epidemic of data breaches and other cyber crimes. It has been a challenge to distill new legislation and policies for school staff, but Henry County is working to keep everyone informed of the best practices. Last year, after a data breach, the district actually had to test their method for communication. It was necessary to familiarize themselves around the laws and the appropriate methods to notify parents about data safety and the breach. Fortunately, there was a process in place to legally and ethically manage the communication and incident.

Conclusion

In too many places, digital privacy, safety, and security is the domain of the few, and is unacknowledged by most. When it is discussed, conversations in school districts often lack the complexity needed to build the essential structures and systems. This reality cannot continue because we live in a digital culture. As access to, and availability of, data increases there must be a deep understanding of data quality, collection, and use, including how it fits into the district's educational mission. Along with communicating proper data management practices, teachers must weave lessons about the mindful use of social media into content material (Ribble, 2012). For this to happen there needs to be people and teams in place to support this work from both a technical/systems level, as well as from a policies, procedures, and practices level. These components are crucial to creating a high quality data rich culture.

Traditionally, educators have always worked together to protect students and ensure data quality, and as education technology evolves, it is critical that stakeholders continue to come together to achieve a safe, healthy, and supportive digital learning environment. However, there also needs to be leaders in place to drive this work forward. District leaders should consider these types of principles and designate personnel to support them, as well as how they will involve stakeholders to make this a team effort. To create an atmosphere of teamwork, support, and alignment, schools must first set standards and expectations for technology and data use, safety protocols, and behaviors, and then ensure that staff understands them (iKeepSafe, 2013).

Roles/Expertise Needed

- CIO
- Chief Data Officer
- Chief Security Officer
- Technology Integration Specialists
- Instructional Support
- Professional Development

PILLAR 5

Strategic Planning

Does your district expect new education technology strategies to improve results or change current practices? Is your district's education technology leader engaged and involved in all design and planning work with district and school leadership?

Explanation

Technology for technology's sake does not benefit anyone. The most effective technology plans and education technology implementation root acquisition and policy decisions in an organization's goals for student learning. How can we ensure that our technology plan stays focused on student outcomes? It is important that education technology and district technology plans support the district's strategic plan and overall instructional strategy. While all districts have unique goals, each district must approach the task of creating a technology plan and implementing education technology by considering their current access, skills, environment, and classroom practices, and how they support the district's strategic plan. Because of this, it's important that your district's technology leader has a seat at the leadership table and works closely with various teams across the district, from the superintendent to the instructional planning team. Districts that support innovative technology usage engage in regular communication about technology with school staff and have policies that support teaching and learning with technology.

The latest technology will have little impact if it is simply being used as a direct substitute for old instructional practices. Teachers who "apply new technology to old pedagogy," such as having students take notes using word processing software rather than pencils and notebooks, aren't likely to see any achievement gains. According to the SAMR model, when teachers can create learning opportunities for students that wouldn't have been possible without the technology, they have reached a level of redefinition. Teachers will need ample professional development to adapt pedagogy and practices using new technology. The district leadership, along with the instructional and technology teams, will need to work together to create an environment that expects education technology to support new strategies being implemented to improve results and change practice. A key aspect to successful integration of technology in school is a "culture that promotes technology use and the adoption of new teaching practices" (Moeller & Reitzes, 2011).

DATA STORY IN KENTUCKY

74% of teachers report the ratio of students to computers from carts is at least two to one.

86% of students report using computers in the classroom at least weekly.

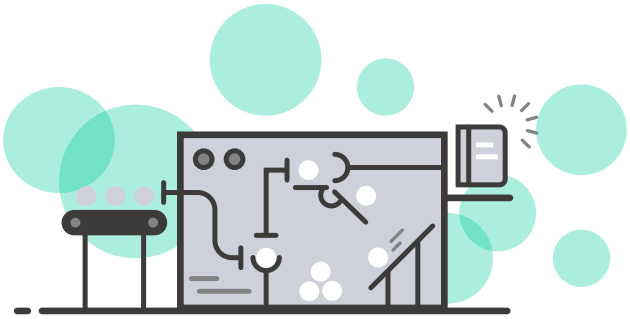
39% of students report being asked to use web tools to receive online information monthly, and 53% of students report never being asked to receive feedback online from someone other than a teacher.

54% of students report never being asked to write online.

Best Practices & Strategies Found in Kentucky

Owensboro Public Schools has put policies, procedures, and practices in place that make it clear that the district expects, and invests in, education technology as a tool to support new strategies to improve instruction, and thus, improve student learning outcomes. Dr. Matthew Constant, Chief Academic Officer at Owensboro Public Schools, explains two ways that Owensboro worked to achieve this goal. First, the district clearly defined what higher order thinking looked like, and then implemented a continuous improvement cycle. By adopting this process, district leaders made what they wanted to see in their classrooms more tangible, so that those supporting the instructional change initiatives truly understood what meaningful instruction looked liked. The district has positioned technology as one of many resources that Owensboro educators can use in the continuum of meaningful teaching and learning. Dr. Constant notes that, "We want technology to be an intentional resource for instructors rather than something that's forced on them just because the district spent the money on technology. We don't have a technology initiative, but rather a district-wide teaching and learning initiative. We are happy to see technology is a tool that teachers are choosing to use to change their practices and to create lessons that generate higher order thinking."

Five years ago when Owensboro began its 1:1 initiative, district leaders were very intentional to message that the devices were part of the district's' teaching and learning initiative, not a technology initiative. It's important to note that before the devices were rolled out the district planned their goals for year five of the teaching and learning initiative. They took a backwards design approach to work in reverse from the five-year vision in order to outline where they wanted to be in year one, two, three, four, and five of the initiative. This approach helped to keep the district's 1:1 initiative firmly grounded on instructional goals and the desired change in practice.



Now, in year Five of the teaching and learning initiative and 1:1 device implementation in third through twelfth grade, Owensboro is beginning to see the changes in instructional practice that it envisioned. To further support this work, Owensboro established a district-wide assessment of the cognitive thinking level of instructional tasks. This assessment is a formative evaluation of what teachers are teaching and what students are learning from each task. This assessment is being used by teachers to assess their tasks through questions to students. Questions include: **What are you doing? Why does it matter? What do you hope to achieve from this?**

> *"We've found nice ways to roll our technology tools into instructional practice and goals. Our teachers now have a clearer understanding of how to assess the cognitive thinking level of instructional tasks and are beginning to use technology as a means to increase cognitive thinking levels. Now it's our job as a district to help teachers learn how to make small tweaks and remodel tasks to achieve instructional goals with technology."*
>
> **DR. MATTHEW CONSTANT**

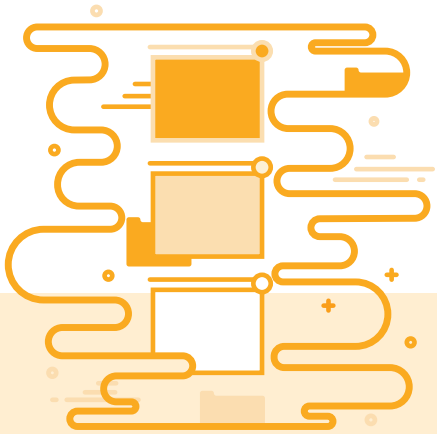
Conclusion

As districts across Kentucky have demonstrated, strategic technology integration and thoughtful instructional practice is key to provide digital devices that improve student learning outcomes. Leaders have also realized that teacher perception, beliefs, and understanding about the role of technology in classrooms is crucial to create meaningful digital learning experiences and shift technology instructional practices from device focused, to learner focus. In order to ensure that these goals can be successful, it is critical that educational leaders develop technology plans that identify student learning outcomes as the priority. Throughout the process, EdTech leaders must strategically integrate technology as a means to support meaningful instructional practices.

By adopting the policies, procedures, and principles that position technology as a tool to enhance learning, educators can provide students with an educational experience that is focused on creative input and output and integrates the use of higher-order thinking skills to integrate new and prior knowledge. This strategic approach is deeply grounded in the concept that teachers' beliefs about technology are considered more influential than their actual knowledge about technology (Kim et al., 2013).

Roles/Expertise Needed

- Cross-department collaboration and data driven decision-making to ensure that technology supports the district's strategic plan and primary focus on student learning
- Leaders that establish strong systems for professional learning and collaboration
- A strong instructional vision and aligned support, including TIS and Instructional Coaches



PILLAR 6

Emerging Technology & Innovation

Are you preparing for education technology to keep pace with changing district needs? Do you expect your EdTech leader to have a growth mindset with industry leading technology that shapes our world and global economy?

Explanation

Technology does not equal innovation. However, many new innovations in learning strategies and experiences require education technology to play a vital role. Whether it is new methods of connecting students to live streaming video feeds to neighboring districts, permitting students to use their own devices in the classroom (BYOD), new and improved wireless technologies, or personalized learning platforms that require live data feeds from other systems, today's EdTech leader must stay on top of the implementation implications to ensure that instructional practices prepare students to succeed in the 21st century. EdTech leaders must also stay informed about the factors that drive change for how classrooms look and operate. This includes student and teacher demands, personalized learning initiatives, expectations for higher student achievement, and new funding opportunities that drive technology investments. (Center for Digital Education. Superintendent's View: Succeeding with Education Technology. 2016)

A successful cultural shift to 21st century teaching and learning requires support for sustained innovation. To gain traction, educators need to understand their role and feel they have the right skill set to achieve organization specific goals.

DATA STORY IN KENTUCKY

43% of teachers discuss technology use during department or grade-level team meetings more than half of the time.

60% of teachers report that they frequently discuss technology use during classroom observations or visits.

63% of teachers are allowed to take home a school-owned mobile computer.

23% of students are allowed to take home a school-owned mobile computer.

Best Practices & Strategies Found in Kentucky

Floyd County Schools is an example that has successfully taken a multi-layered approach to ensure education technology keeps pace with the evolving district's needs. District wide policies, practices, and procedures have been developed to create consistent and clear teaching and learning expectations. These expectations apply to everyone in the district, including administrators, teachers, and students. The goal is to create a culture of learning and continuous improvement.

The first step of this process was to get buy in from the district leadership team, and then, engage the building administrative teams. Now, the district is working to solidify this culture of growth at the classroom level. Floyd County Schools is working to build this culture in a variety of ways, including conducting classroom walkthroughs, developing professional learning communities, offering professional development, and increasing teacher collaboration.

In Floyd County Schools, every district and building administrator is expected to conduct regular classroom walkthroughs. Building administrators are expected to have ten walkthroughs per week within their own school, and building administrators also do walkthroughs at other schools. The district has developed a classroom walkthrough assessment tool to evaluate common focus areas. This tool is research based and was developed in collaboration with forty school-site administrators. It was important to district leadership that principals were involved in this process. The walkthrough assessment tool is reviewed and adjusted after each set of assessments. However, there are about fifteen "look fors" that remain consistent items on the walkthrough assessment tool such as:

- How engaged are students?
- Is content aligned to standards?
- What are the students doing, are kids just listening, or are they participating?
- Are students receiving feedback?

These walkthrough assessments have become part of the culture of Floyd County School, so much so that the Superintendent, every building principal, and even the newest teacher can name each area of the walkthrough assessment tool. It's created an important formative feedback solution for building administrator and teacher growth, guided continuous improvement, and developed a common language and a set of common expectations. The walkthrough assessments are used to inform PLCs and professional development.

Other ways Floyd County Schools drives the expectation of a growth mindset and continuous improvement is through PLCs, professional development, and increased collaboration. While PLCs are created at the school level, Floyd County Schools has created PLC guidelines and monitors PLCs at the district level. These guidelines outline clear expectations for the goals of PLCs, as well as the PLC conversation structure and reporting metrics. This helps create consistency and a common language focused on shared instructional goals. The district encourages teachers to take the lead in professional development in areas where they are strong. For example, at the district's professional development academy held every summer, most sessions are held by teachers that excel in a specific area, such as using technology for formative assessments.

Last year, Floyd County Schools proved their success building the culture of growth and innovation at the classroom level. There was a teacher-driven initiative to implement Google Apps for Education to increase teacher and student collaboration. The district took the lead from its teachers and rolled out Google Apps for Education.

Floyd County Schools is also integrating this learning and innovation culture at the student level. The district is intentionally creating more opportunities for student voice and choice in instruction and revising class schedules to include more options for technology and career focused pathways.

Conclusion

Given the speed of technological change, today's vital tool or device-oriented skills may be irrelevant or completely reimagined by the time today's kindergartners go to college. However, while tools and devices will certainly evolve, it's clear that students will need a high degree of comfort with, and knowledge of, technology to be considered college and career ready. More than anything, they will need the skills to think critically and to be a continuous learner. It's just as important that teachers and district have these skills as well.

One strategy for creating a culture of continuous improvement is to frame the work as necessary growth, instead of an attempt to correct an undesirable situation. To identify where adjustments need to be made, district leaders must develop a clear understanding of the organization's current culture, including its central beliefs and values. District leaders can capture the essence of the current culture by using strategies such as surveys, focus groups, and simple observation. They should also gather and review thoughtful input from district stakeholder groups, but remember that much of this information will be colored by personal perceptions. (Center for Digital Education. Superintendent's View: Succeeding with Education Technology. 2016)

Roles/Expertise Needed

- Professional Development
- Building Administrators