

The Decision To Go Digital

A Roadmap for Planning and Implementation

How can you shift your educational institution to using more digital content, or even go entirely textbook-free? The path isn't the same for every school, but there are some common steps to take.

This planning framework is designed to help school leaders and teachers successfully implement digital content into their learning curriculum.

Step 1: Develop a Team

Step 2: Develop a Plan

Step 3: Build the Infrastructure

Step 4: Build a Digital Curriculum

Step 5: Consider Devices

Step 6: Learning Management Systems (LMS)

Step 7: Security and Privacy

Step 8: Teacher Training

Step 1: Develop a Team

The first step to going digital is to develop a strong network of professionals working together to support the various components of a digital program. A well-defined team that meets regularly will move the objectives of a district forward.

The team should consist of these titled and/or equivalent positions:

- Assistant superintendent for curriculum and instruction
- IT administrator
- Technology instructional specialist
- Teacher from every level
- Subject matter leaders in all disciplines
- Principal from each level
- Selected student representatives

In addition, the team should be advised by a broad-based community group which includes:

- A municipal leader
- Business partners
- Parents
- Community organizations representatives
- If possible, a local member of the state legislature (or his/her aide)

Giving each of these representatives a voice will enhance decision making and provide support for community outreach and advocacy, especially when funding is needed. Such an advisory committee builds partnerships for future development purposes.

Step 2: Develop a Plan

The next step is to establish goals, objectives, strategies, and measurable outcomes for the use of digital content.

First, begin by analyzing your current digital content program. Consider asking yourself:

- How are we using digital content right now?
- What are the strengths and weaknesses of our system?
- What are other districts doing? Is it successful?
- What will developing a digital content plan mean for us?
- What potential political and financial challenges might we encounter?
- What resources will we need to begin implementing digital content?

Next, identify your instructional objectives:

- What should students know and be able to do?
- What do state and national standards say they need to know and do?

Then, move to content and instructional decisions:

- What content and skills must we teach for students to meet standards?
- How can digital content help students reach these standards?
- What learning experiences must students have?
- What learning environments are best for success?
- How can we capitalize on student interests?
How can we incorporate technology from their daily lives?
- How can we educate the whole child?

Finally, create a digital migration strategy:

- What is our plan for acquiring the necessary digital resources?
- How can we ensure both equity and access for all students and teachers?
- What steps need to be taken to enable students to achieve our objectives?

Step 3: Build the Infrastructure

To take full advantage of today's technological devices, you need to build a strong infrastructure and provide reliable, fast WiFi. Making the shift to digital content will inevitably increase the number of networked devices in your school, creating heavy demands on your network infrastructure.

- Will the network be able to handle large a number of devices simultaneously, for example, at the beginning of class periods when students log on to the network at the same time?
- Will students be able to rely on network access 24/7?
- How will you ensure enough bandwidth to handle multimedia applications?

Contact local vendors and network specialists to determine the best set-up for your district goals, existing infrastructure, and budget. If you open your doors to student-owned devices, keep in mind that many students will likely carry more than one device (a smartphone and a tablet, for example). Also account for networked printers, interactive whiteboards, and videoconferencing equipment when calculating your network needs.

Wireless infrastructure must also have the capacity for growth. Developing technologies demand an increasing amount of bandwidth, requiring schools to devote a large amount of their technology

budget to infrastructure investment. Within 5 years, you can expect to see a 4- to 10-fold increase in demand, so prepare for growth.

Virtualized Desktops

Virtualized desktops are another infrastructure option to consider. Through a central server, students and teachers can log in and access apps from any campus location with Internet access. One advantage of virtualized desktops is that the infrastructure can be securely outsourced. In addition, districts can save money on software licenses and streamline the path toward digitized content.

Infrastructure Considerations

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- Do you have enough access points, either physical or virtual?
- How many devices per student or per classroom can your network accommodate while still maintaining fast connectivity?
- Will you use cloud services, if so, what types of security issues will need to be addressed? What type of management software will you need to install?
- Is your infrastructure solution scalable?
- Does your configuration avoid bottlenecks and single points of failure?
- Are consumer cloud services and Web applications being used without IT oversight?
- Do you have network analytic tools and academic analytics in place?
- To what extent have you adopted virtualization? Is your data center virtualized?
- Have you considered whether a virtualized desktop infrastructure would work for you?

Step 4: Build a Digital Curriculum

Once your infrastructure is in place, you'll need to look at the material you wish to provide to students. Rich digital content can take many forms. It can be provided in standards-based packages that build upon textbooks, with teacher's guides, assessments and multimedia content all included and aligned to standards. It can be created collaboratively, in open source format, by a variety of experts. Or it can be drawn from multiple sources- subscriptions, free online resources and other digitized material- customized locally to meet the needs of a particular classroom, grade or district.

Digital curriculum may come from several different sources, including:

- Commercial publishers
- Software publishers
- Open educational resources
- Libraries
- Teacher-created curriculum

Category	Examples
Comprehensive Instructional Software	<ul style="list-style-type: none"> • Destination Success (Houghton Mifflin Harcourt) • SuccessMaker (Pearson) • Breakthrough to Literacy (McGraw Hill)
Sheltered Search and Content Libraries	<ul style="list-style-type: none"> • Questia • NetTrekker • ABC-CLIO • ProQuest K-12
Video and Multimedia Collections	<ul style="list-style-type: none"> • Safari Montage • Discovery Streaming • BrainPOP
Games, Experiments and Simulations	<ul style="list-style-type: none"> • Muzzy Lane • ExploreLearning • PASCO Scientific
Online Classes	<ul style="list-style-type: none"> • Apex • OdysseyWare Online • Florida Virtual School • Education 2020
Tools for Publishing, Analyzing, Collaborating and Visualizing/Modeling	<ul style="list-style-type: none"> • Google Apps • Microsoft Office • Open Office • Adobe Creative Suite • Inspiration • GIS for Education (ESRI) • Various wikis and social networking tools
Curriculum Management and Assessment Tools	<ul style="list-style-type: none"> • DyKnow • EDMin • Blackboard • Moodle • Project Tapestry (Pearson) • Qwizdom • eInstruction • EduWare

Types of Digital Content

This table presents some examples of digital tools that allow for adaptive, personalized, and engaging learning experiences for K-12 students.

Digital Classroom Models

Having a digital curriculum allows districts more flexibility in how they offer courses and classes. Some options include:

- **Online Learning**

Instruction by a web-based educational delivery system provides a structured learning environment. It may be accessed from multiple settings in or out of a school setting. It expands educational options for students with wider course offerings, new formats, and an extended learning community.

- **Blended Learning**

Blended learning combines online learning with other modes of instructional delivery. Rather than learning online at a distance, students learn in an adult-supervised school environment for at least part of the time. A blended learning model places value on the teacher's face-to-face interactions with students.

- **Face-to-Face**

Even though students come in to a physical classroom, they can still participate fully in a digital curriculum with self-paced learning if needed. Teachers may choose to place students in small groups where they use technology tools to direct their own learning.

Digital Citizenship

Direct instruction on Internet safety, search strategies, copyright, and netiquette can also be incorporated into a digital curriculum. Proper training will help ensure that all students are well-prepared to begin using technology every day in a safe, respectful, and responsible way. When combined with a well-defined AUP, a unit that specifically teaches digital citizenship may lead to fewer issues within the program.

Step 5: Consider Devices

Once a digital curriculum is established, districts must decide on which devices best fit their educational goals and digital requirements. Budget-conscious schools might be tempted to purchase

Device	Benefits	Limitations
E-readers	Inexpensive Support digital textbooks Mobile Lightweight	May not have full interactivity May not have full network connectivity May not run educational apps
Netbooks/notebooks	Inexpensive Contain a keyboard for easier content creation Mobile	Lack a touchscreen No mobile operating system May not support educational apps
Tablets	Wide variety of sizes Support educational apps Mobile- very portable Touch screens highly interactive, tactile experience	More expensive Relatively fragile No keyboard May not support Flash files
Hybrid Devices	Use various combinations of netbook and tablet features, such as touch-screens and keyboards	
Laptops	Full keyboard Large screen with high resolution Relatively durable	Heavier, less portable than smaller devices More expensive
Desktop Computers	Capable of large hard drive and storage Large screen Full size keyboard Supports all file types	Not portable May not support educational apps

“inexpensive” eBook readers or netbooks with fewer features than full-fledged computers, but such a move can actually cost a district more if the new devices do not meet all the needs of the students or teachers who will be using them. In selecting a mobile device for classroom use, it is important to view it as a total learning platform and look for a device that supports a variety of curriculum uses, not just one of them.

Consider some of the advantages and disadvantages of different devices:

The next decision involves how devices will be allocated, managed, and used on a daily basis. Consider different technology integration models, each with its own advantages and limitations:

1:1 Technology Initiatives

- Device for every student, anytime access
- Uniformity of devices and platforms
- Controlled access to the school network
- School-purchased, sometimes parent-financed
- Costly upgrades and maintenance repairs
- Devices may not be as up-to-date or have the same features as devices that students use outside of school
- Large demands on the technology budget

Computer Labs and Mobile Carts

- School-financed devices
- Controlled network access and security
- Uniformity of device type, platform
- Limited access
- Requires scheduling and pre-planned learning activities
- Students share devices
- Costly upgrades and repairs

Bring Your Own Device (BYOD)

- Device for every student, anytime access
- Parent-financed
- Devices typically up-to-date
- No cost for upgrades or repairs

- Lack of uniformity of devices and platforms
- Uncontrolled network access
- Requires a robust network infrastructure with large bandwidth
- Limitations of mobile devices

Mobile Devices vs. Traditional Computing Devices

Although mobile devices offer many advantages, such as anytime—anywhere learning, there are times when students will require a desktop computer. Many software programs require a computer with a file structure and mouse input, even if they offer a companion mobile app to supplement the software program. Not all software features and file types are supported on mobile devices.

- What will students use when they require a keyboard?
- How will students use software programs that require a “real” computer?
- What will students use when they need a larger screen?
- How will students access files that are not supported on their mobile device?

Step 6: Learning Management Systems (LMS)

Digital content is increasingly being organized through an LMS, or learning management system. A learning management system is an online platform that enables the delivery of materials, resources, tools, and activities to students both in and out of the classroom environment. It allows teachers to offer tailored instruction that can be accessed by students anytime, anywhere without geographic constraints.

While the online environment of an LMS shares many features with traditional teaching and learning, it also has some unique attributes, such as flexibility (anytime, anywhere) along with time for reflection and learners' anonymity. Additionally, learning management systems offer the convenience and support of a common system used by teachers, support staff, students, and parents.

Many K-12 districts say they are starting to use a LMS due to the Common Core State Standards, which emphasize digital assessment and personalized instruction. An LMS allows districts to easily track, modify, and share student information. It can also be used as an organizational tool for all of a district's digital content, resources, and professional learning communities.

Use the questions below as a starting point for evaluating and choosing an LMS.

Purpose

- What primary purpose will my online platform serve?
- Will it be used primarily to support discussions? Post assignments? Foster group work outside of class?
- What types of LMS tools will support my planned purpose and objectives?

Existing Resources

- Does my district already have a license with a particular LMS?
- Does my district already provide Web space on the school site to post homework and announcements?
- What existing resources are already provided by my district? Am I required to use these resources?
- Are any other teachers familiar with using an online platform?

Technology Infrastructure

- What are the biggest hurdles for student access to technology at my school?
- Will my students be able to access the required technology?
- Does my district have an Internet filter? Will this limit my ability to use a particular LMS?

Budget

- What is my budget?
- Can I accomplish my goals with an open source, free learning management system?
- Does the LMS charge fees per user? What about use fees?
- Will the LMS charge extra for additional items, such as data, file storage, or video streaming?

Multimedia Tools

- Do I plan to incorporate multimedia on my site?
- What kinds of media need to be supported?
- Do I need synchronous communication tools?
- If I plan on presenting synchronous lesson content, does the platform support the capability to archive and post my lesson for students to review?

Assessment

- Do I want to be able to post online quizzes and exams?
- Does my school require an online grade book? If so, am I required to use the one provided or can I choose my own?
- How much data do I expect to receive on student performance and usage?

- What assessment features am I looking for? Do I want self-scoring assessments that pull questions from a question bank? Do I want automated feedback for each question?
- Do I want a learning management system that supports the creation of rubrics?
- Do I need anti-plagiarism tools?

Communication

- Do I want to simply transmit information to students, or do I want to create an online community?
- Do I want videoconferencing capabilities?
- Do I need file sharing?
- Do I need community discussion forums?
- How much use of asynchronous communication tools do I expect?
- Does the LMS support internal messaging services, or will I need to provide e-mail accounts?
- Do I want an RSS feed feature to ensure that new messages and announcements are sent directly to student and teacher e-mail boxes?

Design

- Do I need the ability to customize the color, language, layout, and design?
- Is the user interface intuitive, or is it difficult to find my way through the maze of features?

Accessibility

- Do my students need mobile access to the site?
- Is the online platform compatible with smartphones?

Technical Support

- What support resources are available if I have questions about the learning management system?
- Who can I contact for technical help? What is their availability?

Step 7: Security and Privacy

Making the move to digital content brings with it a host of security concerns, including data protection and compliance with the Children’s Internet Protection Act (CIPA).

- How will you protect student information and avoid data security conflicts?
- How will you protect your network from viruses and malware?
- Will students be protected from unsolicited email and inappropriate sites?
- How will you monitor Internet usage?

Protective wireless infrastructure for a digital program provides a segmented student network that is separate from the one used by teachers and administrators, thereby avoiding data security conflicts and protecting student information. Built-in authentication procedures enable monitoring of Internet usage while ensuring that only legitimate users are allowed to access the network.

Another protective measure involves the use of a virtual private network client that runs in the background and is able to tunnel 3G and 4G network traffic through the school network. When this happens, the school content filtering rules are applied, even when students take mobile devices home.

Successful school technology programs have strategies in place to help with classroom management of different devices and activities. They establish and communicate an acceptable use policy (AUP) that specifies where and when devices can be used, as well as policies for social networking and messaging. If your district plans to open your schools to student and staff-owned devices, previous versions of the district AUP must be updated to address specific BYOD policies.

When developing an AUP, first define the goals and intended results. For example:

1. Outlining appropriate behavior in positive terms
2. Specifically outlining inappropriate behaviors
3. Outlining the procedures involved with following or not following the AUP

Step 8: Teacher Training

For a digital curriculum to succeed, it needs to be taught effectively. This requires both teacher buy-in and ongoing professional development.

Without proper professional development, a digital curriculum may not live up to its expectations. Simply filling a classroom with technology devices, or inviting student-owned devices into school, does not raise achievement; rather, it's how teachers choose to implement the devices that can determine if a digital curriculum succeeds or fails.

After implementing a digital curriculum, establish a plan to provide ongoing professional development and extensive training for staff members who are responsible for implementing the program and procedures on a daily basis. Teachers who may be more comfortable with print texts and traditional teaching methods will require a new skillset of digital classroom management strategies and a greater depth of knowledge about technology.