

Introduction

As K-12 classrooms — and the digital natives who use them — become increasingly dependent on cloud- and Internet-based technologies, wireless networks and mobile devices, touchscreen monitors and displays, digital content and personalized learning solutions, educators are scrambling to find, deploy and manage tools that allow their schools to quickly and cost effectively shift to new teaching and learning paradigms. They need solutions that promote collaboration among students, teachers, administrators and parents; support new student assessment plans; and comply with document security and privacy mandates, among other requirements.

Given the ongoing lack of education dollars, this is no easy achievement. However, today's advanced scanning

technologies can help. First, they allow educators to implement digitally delivered educational experiences that provide the best student outcomes. In addition, they enable schools and districts to reduce the cost and complexity associated with managing and storing reams of paper records and copies by streamlining workflow and improving record keeping. Finally, they allow educators to digitize existing materials for incorporation into curricula.

The Center for Digital Education (CDE) surveyed over 130 K-12 decision-makers on the classroom use of printer and scanner technologies in September 2014 and found scanning materials for digital use in the classroom is a key concern, with ease of use, cost containment and flexible deployment among the most critical needs. In the context of this study, this white paper will build a case for the use of scanners to revolutionize K-12 teaching, learning and administration.



Quick Tip:

Today's advanced scanning technologies allow educators to digitize existing materials for incorporation into curricula.

Types of Assessment, Collaboration and Communication Initiatives Over the Next Two Years

Improving communication with students and parents via Web-based portals

69%

Reducing paper-based output by increasing document scanning and handling

68%

Increasing the use of student assessment and document management technologies

65%

Increasing/extending BYOD support

47%

Improving document security and compliance with mandates

26%

Source: CDE K-12 Print and Imaging Survey, 2015

Making the Case: Scanners in K-12 Education

K-12 education is in the midst of tremendous upheaval as it transitions to digital teaching and learning paradigms. Computing devices have moved from the principal's office and the computer lab to the classroom and into student backpacks and pockets. Wireless and mobile networks have extended learning far beyond the four walls of the classroom. The traditional "sage-on-a-stage" model of a teacher lecturing in front of a chalkboard to a class full of seated students is quickly becoming passé.

5 Key Trends Driving Change

Digital solutions, including content capture and delivery, are becoming an educational imperative. Five key trends are driving this imperative:

1. Transition to a standardized curriculum and digital learning
2. Learning needs of digital natives
3. Parent and teacher expectations
4. The "paperless school"
5. Workflow and process automation

1 Transition to a standardized curriculum and digital learning. The purpose of the Common Core State Standards, a standardized curriculum framework for math and English, is to prepare students for college and the future global, competitive workforce. Adopted by more than 40 states, the standards emphasize the use of technology and collaboration as a way to master content and skills.

The most effective digital learning methods tightly integrate technology with the learning experience and allow students to participate in collaborative teams. In fact, the CDE survey found schools have adopted or are planning to adopt a variety of communication, collaboration and assessment initiatives, including Web-based portals for students and parents (69 percent); document scanning, handling and archiving (68 percent); and student assessment and document management technologies (65 percent).

The digital learning environment that supports the standards is characterized by one-on-one knowledge and skills delivery, a customized experience and personalized content. Teachers facilitate learning based on individual student requirements, expertise level and content needs. Some students are participating in fully online



Quick Tip:

To recruit teachers with fresh skills and perspectives, districts need well-planned technology strategies and the tools and resources to properly execute them.

schools or distance learning programs, but most are dividing their time between a supervised, face-to-face school setting where they spend time in classrooms or online, and a more flexible environment where the student has some control over time, place or pace of learning. Depending on the school's budget and strategy, online learning may occur in a computer lab environment or in a classroom, using either a school-owned or student-owned computing device.

It's important to note that many schools and districts are in some phase of transition from traditional teaching and learning to new models. Most understand the inevitability of the digital transformation, but many aren't able to make a complete transition due to technology and budget gaps. Further, many educators still prefer traditional teaching methods. This means schools are at various maturity levels in their quest to transform to digital teaching and learning.

2 Learning needs of digital natives. Today's students have grown up with ubiquitous Internet connectivity and unprecedented access to desktop and laptop computers, mobile phones, tablets and other computing devices. But these so-called "digital natives" are doing more than playing games and texting with their friends – they're using technology to make decisions, manage information, and develop and engage in meaningful social relationships and networks.

To keep digital natives engaged in learning in an environment where changing technology is the norm, schools must employ teaching methods and resources that emphasize new ways of finding information, learning, communicating, thinking, socializing and problem solving.

3 Parent and teacher expectations. The same technologies that digital natives depend on are also key drivers of parent and teacher expectations. Parents expect school districts to be equipped with the latest technologies so their children are competitive in their post-K-12 endeavors, including colleges, universities and the global workplace.

In addition, the newest teachers are digital natives as well. To recruit teachers with fresh skills and perspectives, districts need well-planned technology strategies and the tools and resources to properly execute them.

4 The "paperless school." The private sector is taking steps to eliminate paper to create efficiencies and save money, a trend still in its early stages in K-12 education. In the classroom, technologies such as learning management systems; blogs and websites; digital content; cloud-based storage; and mobile apps for interaction, sharing and collaboration help reduce dependency on paper handouts, expensive textbooks and course packs.

Office staff and administrators are beginning to use document management and archiving systems to reduce the use of paper to conduct classroom observations and performance reviews, maintain student medical records, and share meeting agendas and notes.

As education institutions reduce the use of paper, they're able to reinvent workflows to maximize staff, teacher and student efficiency while conserving scarce budget dollars. Over time, it makes good business sense for schools and districts to adopt technologies that enable them to use less paper in administrative and classroom settings.

5 Workflow and process automation. Reducing reliance on paper also enables workflow and process automation. Schools and districts have many technology solutions at their fingertips. However, with limited technical expertise to operate and maintain these tools, automation is critical to maximize efficiency and productivity of IT staff and end users. This is as true for the administrator's office as it is for the classroom.

In the earliest wave of adoption, schools are experimenting with solutions that save money by improving learning and administrative workflows and support real-time information delivery to teachers, learners, decision-makers and other end users. Examples include student information systems (SIS), course management systems (CMS), enterprise resource planning (ERP) systems and cloud computing.

These five trends are continuously impacting K-12 schools and districts, and are creating a variety of challenges, as revealed by the CDE survey. For example, CDE found the top challenges facing today's schools are meeting overall

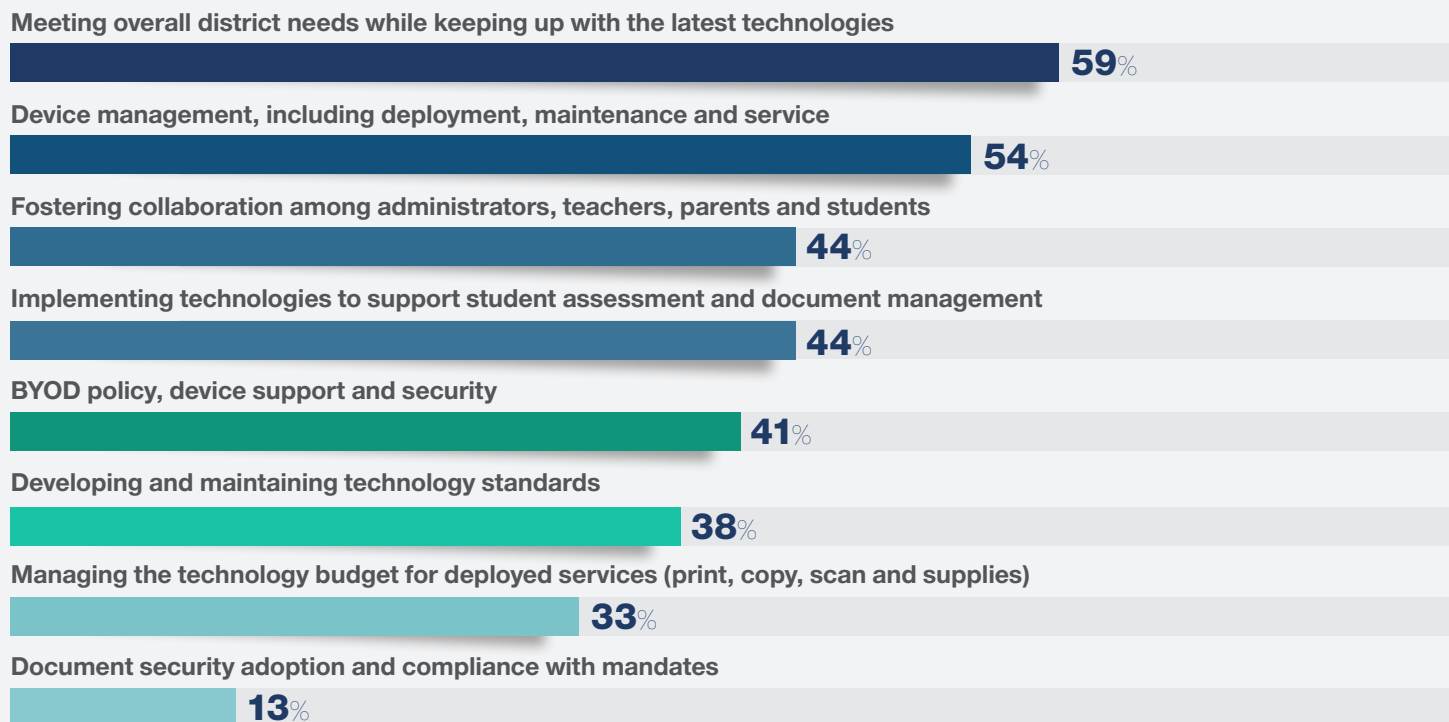
district needs while keeping up with technology trends (59 percent of respondents) and overall device management (54 percent). Other critical challenges are collaboration (44 percent) and implementing technologies that support student assessment and document management (44 percent).

Advanced scanning technologies can play an important role in addressing these five trends and their associated challenges. School and district leaders, technologists and educators understand this, as reflected by their use of scanning technologies: 65 percent of CDE survey respondents said scanner usage has increased over the last two years.

The top reasons given for increased scanner use were:

- ✓ Increased collaboration and sharing of documents
- ✓ Pressure to reduce costs
- ✓ Student assessment requirements
- ✓ Increased mobile device usage
- ✓ Regulatory requirements

Top Challenges in K-12 Education



Source: CDE K-12 Print and Imaging Survey, 2015

The use of scanners by educators and administrators to address the challenges of digital teaching, learning and administration has resulted in a number of different use models for scanners in the K-12 environment.

Use Models and Benefits: Scanners in the Classroom and the Back Office

In this section, we'll review how schools in any stage of adopting digital learning tools and methods can use scanners in the classroom and the back office to begin, advance or complete the transition to digital learning.

In the Classroom:

Driving the Transition to Digital Learning

In the classroom, scanners can be used to deliver digital learning in many ways. One of the most important uses for scanning technology is for exam scoring, especially as schools make the transition to online testing. Even though Common Core testing via the Smarter Balanced Assessment Consortium (Smarter Balanced) and the Partnership for Assessment of Readiness for College and Careers (PARCC) is managed online, other assessments in math and English, as well as testing in other subjects, may be a mix of online and paper-based methods for the foreseeable future.

The CDE survey revealed more than half (51 percent) of survey participants are already using online assessment tools, and about the same number (55 percent) expect the use of these tools to increase in the next two years. Scanners can help schools and districts ease the transition to online assessments by enabling educators to apply the improved workflow of online assessments to traditional paper-based form or bubble tests. They can scan into and print from applications that allow them to easily develop and administer customized tests and analyze student progress. This enables them to improve the assessment workflow by using paper answer sheets and off-the-shelf desktop scanners to quickly access test results and evaluate student performance data online.

In addition to exam scoring, scanners help educators save paper in the classroom and enable online sharing and team projects by replacing the copier function with digital scans of tests, homework, reports, books, photos and other paper-based materials to desktop or laptop computers, mobile devices, flash drives or even the cloud.

Does Your District Use Online Assessment Tools?

Yes

51%

No

35%

Don't know

14%

How Do You See the Use of Online Assessment Tools Changing Over the Next Two Years?

Increasing

55%

Don't know

24%

About the same

18%

Decreasing

3%

Source: CDE K-12 Print and Imaging Survey, 2015

In art and media classes, scanning original artwork or copies of art provides students with electronic access to high-quality art duplications.

Replacing paper with scans can support efforts to improve collaboration and communication. For example, instead of relying on students to pass along copies of paper classroom documents and work to their parents, required materials can be scanned and emailed instead. And scanning paper materials for use in cloud-based learning management systems and email applications supports tutoring, remote learning and distance education initiatives.

Scanners with integrated optical character recognition (OCR) technology enable documents to be electronically edited and searched, which allows teachers to customize and archive documents. Historical books and bound materials can be archived for future classroom or library use. Finally, by scanning in paper copies of their work, students can create digital portfolios for assessment or display.

12 Ways to Use Scanners in the K-12 Classroom and Back Office

- 1 Scan optical mark recognition tests and forms for processing by grading software.
- 2 Support remote and distance learning by scanning and emailing class materials and tests to students, parents and tutors.
- 3 Encourage parental involvement by scanning and emailing student work.
- 4 Create PDF files of student term papers and projects for sharing and collaboration.
- 5 Create editable electronic copies of paper documents.
- 6 Scan and digitize books, photographs, newspaper articles, artwork and other materials for classroom presentation, student resources, sharing and archiving.
- 7 Scan student artwork and classwork for student portfolios.
- 8 Digitize student records to comply with FERPA.
- 9 Create electronic copies of student health and medication forms.
- 10 Create electronic copies of bound materials, business documents and other papers for archiving or enterprise-wide distribution to teachers, parents and administrators.
- 11 Input paper documents into student information systems.
- 12 Digitize and email handwritten meeting notes.

In Administrative Offices:

Improving Productivity, Lowering Costs

School and district administrative offices use scanners to cut costs and improve productivity by digitizing student records and content and document management.

Many schools are migrating to SISs for recording and tracking enrollment information, grades, test scores, course registration, attendance, health information and other student data. Administrative staff can meet privacy requirements for the Family Educational Rights and Privacy Act (FERPA) by using scanners to capture data from existing paper-based records, creating a workflow for routing information to the appropriate records, and for developing retention and security strategies.

Scanners also enable the transition to content management strategies based on enterprise-wide document archiving and management solutions that allow districts to electronically share information, such as employment applications, school board agendas and notes, teacher contracts, paper handouts and other business documents that must be distributed throughout the education enterprise. Reducing the use of paper saves money that can be diverted to educational programs and initiatives, and improves staff productivity by eliminating workflows associated with physically handling and managing paper.

How to Select Scanning Systems and Solutions

A variety of scanners is available for the education market. With the help of your vendor, you can evaluate basic scanner features (e.g., scanning speed, resolution, automatic or single-sheet feeder, and energy efficiency) based on the use model, proposed location, projected amount of use, number of potential users and scanner cost. In general, there are five types of scanners that your organization will probably need.

1 Sheet-fed scanners. Sheet-fed scanners feed pages past a scanning head. The pages can be fed by hand or via a document feeder that automatically feeds in and scans multiple pages at a time. Sheet-fed scanners with document feeders are ideal for scanning test sheets used with assessment management software and online assessment tools.

2 Flatbed scanners. To use a flatbed scanner, a document, photograph or book is placed facedown on the glass surface of the scanner and a scanning head under the glass captures the scan. It allows users to scan a variety of media types, including paper, books and even multi-dimensional objects, making them an indispensable selection for libraries and media labs. Flatbed scanners frequently have document feeders for automatically feeding multi-page documents.

3 Handheld and portable. Handheld and portable scanners are small, inexpensive and manual. They typically have the ability to feed in and scan a single sheet at a time. Some handheld or pen/wand style devices require the user to pass the scanner over a document.

4 Multifunctional devices. Multifunctional devices integrate more than one type of technology into a single device. This category includes “all-in-one” machines or combinations of printer/scanner/copier/fax technologies frequently used in administrative settings.

5 Specialty scanners. Some schools may have a need for scanners with customized technology for scanning photographic film, business cards, receipts or other specialized documents or media.

Other key scanner features to evaluate are those that enable collaboration and sharing among multiple types of users, including:

- Integration with online assessment software, OCR technology and other required applications, such as those needed in libraries and media labs or back-office applications such as enterprise content and document management
- Integration with wireless networks to enable scan-to-cloud or Internet-based archiving and collaboration systems
- Ability to connect and scan to multiple device types, including mobile and storage devices, with no requirement for driver installation
- Security features that include industry standard security levels to ensure FERPA compliance and prevent unauthorized users from accessing test answers and other teaching materials

Summary of Scanner Benefits

- Enables transition to new learning models
- Smooths transition to paperless back office
- Promotes collaboration
- Increases document security
- Improves productivity and saves time
- Reduces paper and associated costs

Look for a vendor with a variety of scanner types and models at appropriate price points. Vendors should have proven experience in the education market, a solid understanding of the needs of the education market for competitive pricing and operational efficiency, and a willingness to learn about your school’s specific needs and potential use models. A comprehensive and cost-effective service plan offered by the vendor or your preferred solution provider should also be evaluated and considered.

Conclusion

K-12 decision-makers must develop strategies and prioritize technology purchases to address new teaching, learning and administrative management paradigms.

The use of advanced scanning technologies can assist in the transition to new models that support critical initiatives, including standardized curriculum and digital learning, sharing and collaboration, paper reduction, and workflow and process automation. When they rely on scanners to help them reach their education and administrative goals, K-12 schools and districts can improve collaboration among students, teachers, administrators and parents; provide learning experiences that improve student outcomes; comply with security and privacy mandates; and realize productivity increases and cost savings.

With features and applications that benefit schools and districts — no matter where they are on the path to digital transformation — today’s advanced scanning technologies have the potential to revolutionize the classroom and the back office.



The Center for Digital Education is a national research and advisory institute specializing in K-12 and higher education technology trends, policy and funding. The Center provides education and industry leaders with decision support and actionable insight to help effectively incorporate new technologies in the 21st century.

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