

# Smart Classrooms + Smart Technology = Smart Students

## ADOPTING BYOD AND VDI PROGRAMS

A WHITE PAPER PRESENTED BY:



September 2013

PREPARED BY

**MARKET CONNECTIONS, INC.** 14555 AVION PARKWAY, SUITE 125 | CHANTILLY, VA 20151

T 703.378.2318 | F 703.378.2025 | [WWW.MARKETCONNECTIONSINC.COM](http://WWW.MARKETCONNECTIONSINC.COM)

© 2013 ALL RIGHTS RESERVED

## Adopting BYOD and VDI Programs: Education to Go—Learning & Teaching Anytime, Anywhere

K-12 education is at the forefront of a technological revolution in which cost savings and efficiency are resulting in educational improvements. Technology in the classroom is not only improving student test performance, it's allowing teachers, administrators, parents, and students to break through the school walls and collaborate in the task of education. A key aspect of this revolution is the emergence of BYOD (bring your own device) and VDI (virtual desktop infrastructure), which allow school districts to keep up with technological advancements so that no student is left behind.

### EXECUTIVE SUMMARY

---

**NetApp commissioned Market Connections, Inc. to conduct a survey to learn to what extent schools are implementing BYOD and VDI programs, the outcomes they are seeing, and how other technology considerations fit into the overall challenges and solutions involved.**

The K-12 education environment is in a state of rapid change. Five years ago, most students came to school with nothing but backpacks and pencils. Today, they arrive with smart phones, tablets, and laptops—sometimes all three. Students and parents alike expect this technology to be supported and integrated into the curriculum because it allows on-demand access to school data and learning resources any time, any place.

Technology is fundamentally changing the way students work, and by extension, how schools teach. From sharing student progress via online applications to flipped classrooms (where students do the learning at home and the homework in class), the educational landscape is shifting rapidly. And the shift is a positive one—multiple studies show that technology use in the classroom improves student achievement. One study found significant increases in reading and math achievement—from 17% to 33% in reading and 18% to 36% in math.<sup>1</sup>

The use of technology is so important, in fact, that *No Child Left Behind, Part D—Enhancing Education Through Technology*, helps school districts bring technology to the classroom through funding to school districts.

In addition to the direct benefit in terms of student achievement, other mandates are moving school districts toward a need to modernize their technology. *The 2014 Online Common Core Assessments* are requiring technology-delivered tests for common core academic standards.

Many school districts are responding to this shift by implementing BYOD programs, which allow students to bring their personal laptops, tablets, and

---

<sup>1</sup> The Journal, "[Study Ties Student Achievement to Technology Integration](#)," April 2009.

smartphones from home and use them for educational applications in the classroom. But for a BYOD program to be successful, the school district and schools need the infrastructure and systems in place to support multiple devices.

Enter VDI, data storage systems, and other supporting technologies—the critical framework for a successful BYOD program. Virtual desktops enable the computer lab and the associated applications and data to come to the student at any time in any place they have a supported device and internet connection—whether in class, at home, the library, or in the community. Costs can be reduced by centralizing the resources that support this technology, allowing for improved funding for direct educational efforts. This makes VDI a natural extension to a BYOD program

For many IT managers, the idea of implementing BYOD and VDI programs is daunting. It seems overwhelming, difficult, and expensive. But with a good implementation strategy, schools can see cost savings with these programs while also keeping up with technology changes.

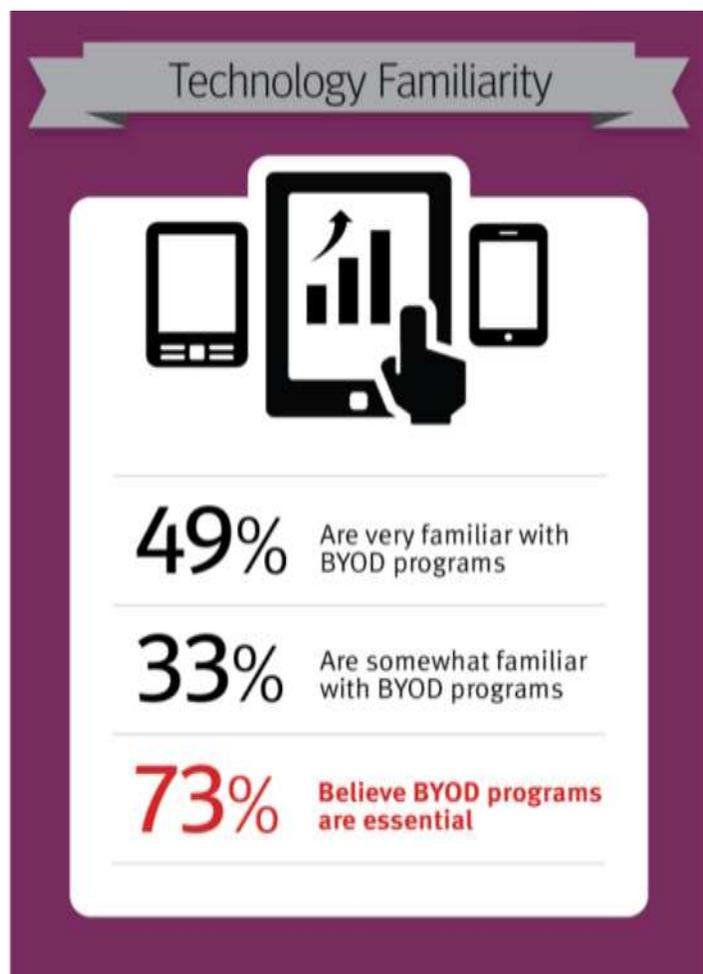
“We’re giving our students unprecedented mobility and allowing them to be as fully functional outside the school division as from their desks in the classroom,” said Douglas Meade, Director of IT at York County School Division. “Such accessibility will change the nature of homework, classroom projects, and assignments, offering as-yet unimagined opportunities to learn.”

Keeping this in mind, NetApp commissioned a research study to plumb the depths of BYOD and VDI programs in K-12 education, gaining insight from IT decision-makers and influencers into who is implementing BYOD and VDI programs, what barriers still stand in the way, and whether the payoff matches the promise of these new technologies. The study by Market Connections, Inc. revealed to what extent schools are implementing BYOD and VDI programs, the outcomes they are seeing, and how other technology considerations fit into the overall challenges and solutions involved.

### CURRENT TECHNOLOGY PLANNING IN THE SCHOOLS

To understand how school districts will respond to technology changes, it’s important to know where they are today. Three out of four survey respondents expect their technology budget to remain the same or increase in the coming year. Almost half (40%) of schools are researching or planning for BYOD and VDI.

At both the district and school level, BYOD especially, is on decision-makers’ minds. Approximately half of respondents (49%) are very familiar with BYOD programs and 33% are at least somewhat familiar with them. Almost three quarters (73%) of respondents believe BYOD implementation

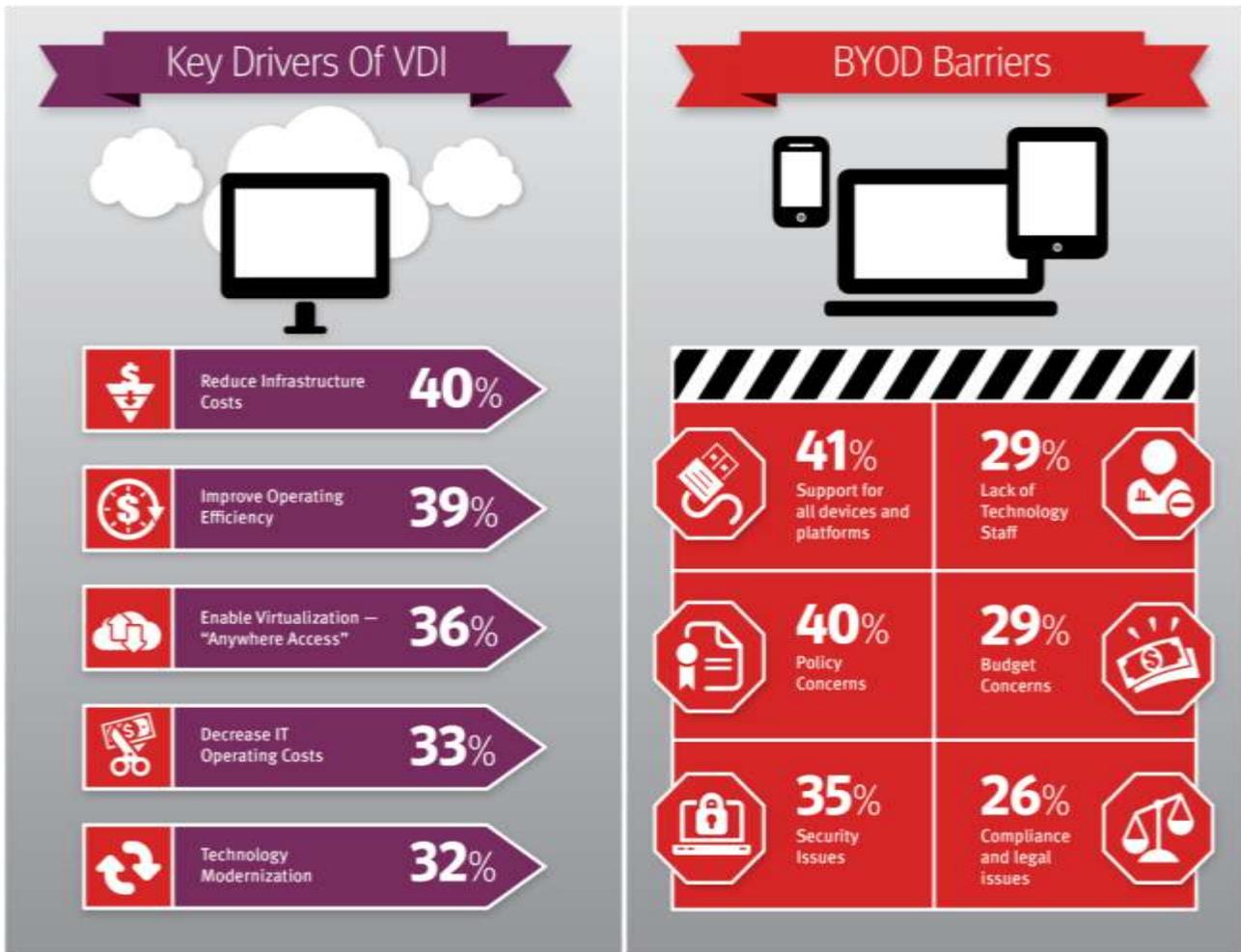


is essential. This likely explains why only 16% of respondents are not considering a BYOD program for their school. The two primary barriers to implementing a BYOD program are concerns regarding supporting multiple devices (41%) and security (35%)—especially regarding student privacy.

While VDI is a critical infrastructure support system for BYOD and addresses these two barriers, it is less well-known and understood. Less than one quarter (24%) are very familiar with it, although about half (51%) have at least heard of VDI. Surprisingly, while 68% of respondents believe virtual desktops will position them well for the future, 25% of respondents are not considering a VDI program. This could be due to the perceived barrier of cost of implementation.

**CHALLENGES FOR THE SCHOOL DISTRICTS**

As the school districts move through the stages of research and planning to implementation, they have challenges to overcome regarding infrastructure and cost. The good news: implementing BYOD and VDI plans are not as complicated—or costly—as they may seem.



Survey respondents have concerns over “the inability of the IT department to configure and maintain” systems and “infrastructure costs to deploy host servers with the resources (CPU, RAM, storage) to host virtual desktops.”

### Infrastructure

As noted, supporting multiple types of devices and security issues are the top barriers to supporting a BYOD program. Security is more of a concern in larger (>20K) school districts than in the smaller (>3K-10K) districts.

When it comes to supporting the devices, connectivity is also a challenge to BYOD. The use of multiple devices makes demands on school’s connectivity, and they simply can’t handle the load or the constantly changing demands.

Some schools and school districts have reacted by forbidding non-school-supplied devices. However, ignoring the need to support multiple devices is not a long-term solution. Schools and school districts that don’t adapt will find their test scores and overall performance suffering.

VDI can alleviate many of the infrastructure concerns around implementing a BYOD program. In fact, the key drivers for implementing a VDI program are reduced infrastructure cost (40%) and improved efficiency (39%).

### Budget

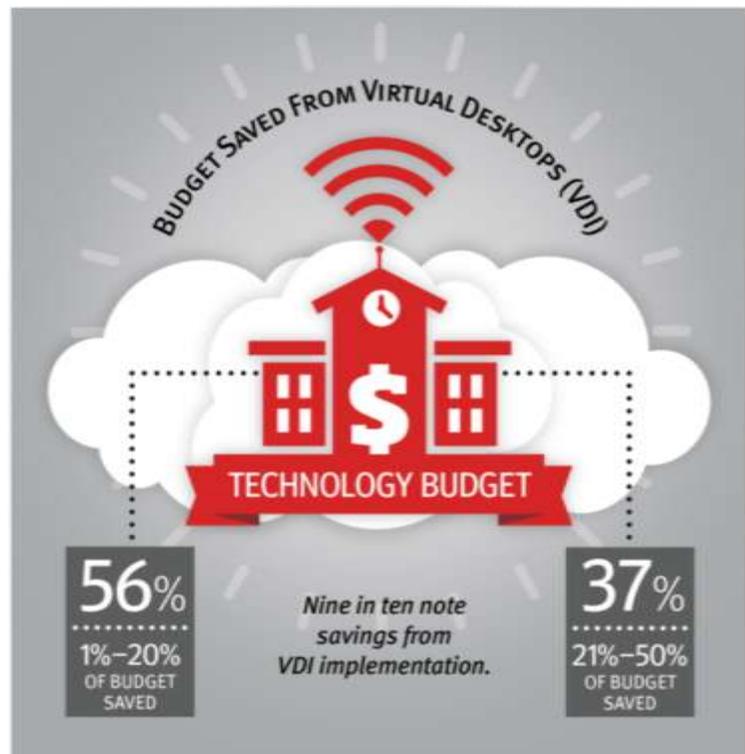
Budget is always a concern for school districts, and that is certainly true when it comes to technology costs. Schools and school districts simply do not have the resources to expend to keep up with the changing pace of technology—such as \$1M for a wireless infrastructure—unless there is a very compelling reason.

In fact, when it comes to implementing a VDI program, cost or lack of sufficient budget is the primary concern (29%) that would hinder migration to virtual desktops. Yet, these same respondents say that reducing infrastructure costs (40%) and improving operating efficiency (39%) are the key drivers of interest in virtual desktops. Of the respondents who have implemented VDI, *nine in ten note a savings* of between 1% and 50%.

While 29% of respondents cite budget as a barrier to implementing a BYOD program, 32% believe these programs reduce overall costs to the school.

“To achieve the most cost savings while increasing student performance, it’s important to think about your entire eco-system, not just a specific product or program,” said Greg Ferguson, NetApp principal architect, state and local government and education.

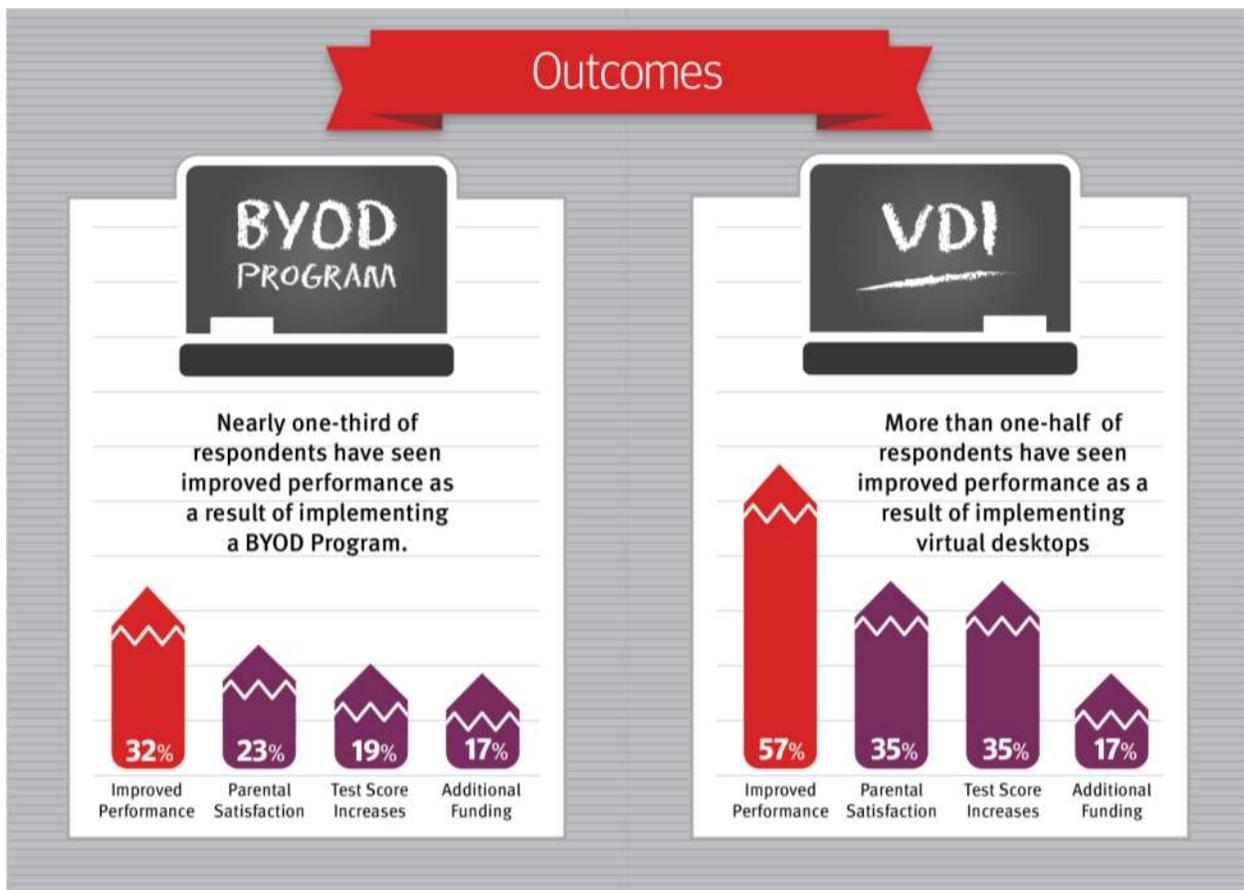
When looking at budget implications for a BYOD or VDI program, it is also important to look at the entire technology eco-system. In particular, data storage represents 40% to 50% of the technology spend in



schools. Yet, this cost can be reduced with the right data storage system, and paired with VDI, school districts can consolidate technology, improving system performance *and* freeing precious resources. In fact, data storage is one of the most effective ways to centralize and manage technology needs and realize savings.

**Other Factors**

Infrastructure and cost aren't the only factors school districts must consider. Issues like parental satisfaction, test scores, and improved performance are also important considerations. In addition, the [Family Educational Rights and Privacy Act](#) (FERPA) ensures the privacy of student records, and school districts have concerns about how VDI and BYOD will impact access to this carefully guarded data. At the same time, there are regulatory changes in place or coming—such as the Common Core: 2014 mandate for schools to provide online testing and the technology provisions in No Child Left Behind—that are requiring school districts to take certain learning online. To meet these mandates, schools must embrace new technologies.



## BUILDING THE INFRASTRUCTURE TO SUPPORT VDI AND BYOD

No doubt, school districts have big technology challenges on their hands. How do they meet technology mandates, ensure an equal learning environment for students, protect student privacy, *and* stay within budget? The answer is to implement a VDI program, which gives school districts one common interface that works across all devices. When supported by other infrastructure investments, the cost savings are significant. For example, the right data storage eliminates duplicative information and streamlines information, significantly cutting costs and increasing efficiency. Using common tools and standardized processes is ultimately more efficient and more secure.

**“Teachers are ecstatic about how fast we can fix problems, update plug-ins, or bring new applications online. And it’s a boost to my job satisfaction to be part of the team bringing in the program that could transform the learning process. It’s extremely gratifying to finally respond to an application request with ‘Yes, you can have it now—and so can all of the other schools.’”**

CHARLES HEALEY  
ASSISTANT SUPERVISOR FOR  
COMPUTER MAINTENANCE  
YORK COUNTY SCHOOL DIVISION,  
VIRGINIA



For example, with VDI and related solutions, the students’ devices act as thin clients, meaning school districts, students and teachers don’t store programs or data on the device. Information is now stored on centralized servers in a secure location. This secure, centralized data storage allows data to follow the student throughout their K-12 education, and allows students to pull their data from any supported device they have access to.

And the latest innovations in storage technology allow schools to eliminate data duplication, reducing storage needs and reducing costs—a very attractive prospect when data storage represents 40% to 50% of infrastructure costs. VDI helps manage the environment by consolidating hardware infrastructure and data storage requirements.

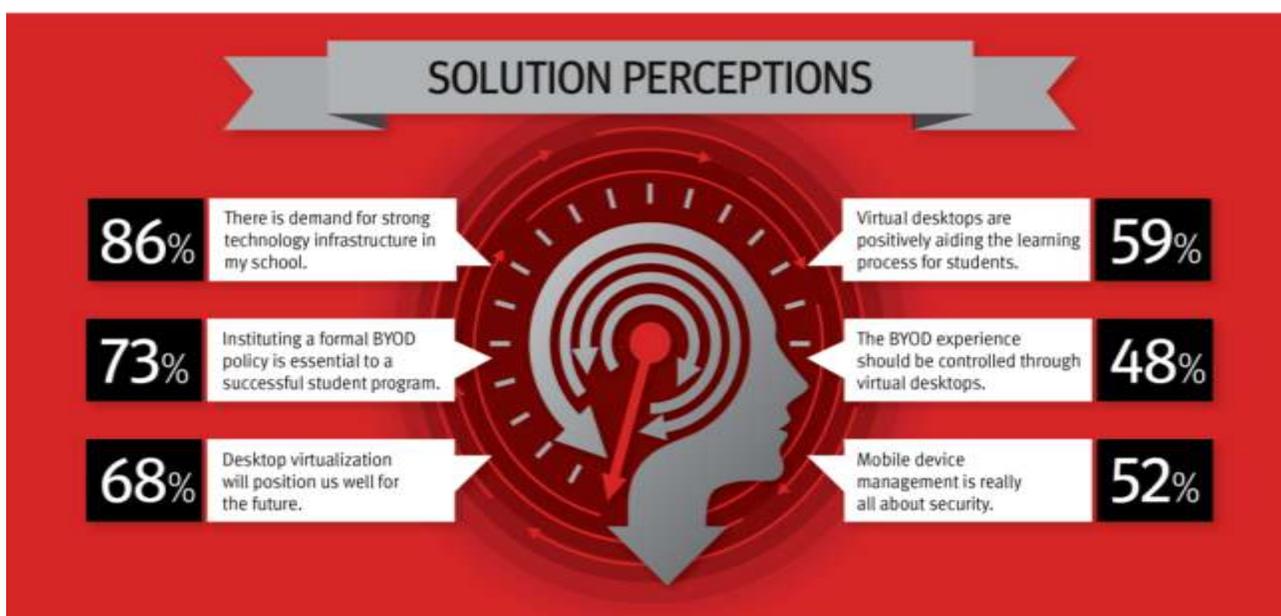
“Typical customer savings are around 70%, which means less storage to buy and more money to use elsewhere,” said Bob Burwell, NETAPP CTO, state, local government and education, U.S. Public Sector.

The Oak Hills Local School District in Ohio achieved a 13-month payback, 166% ROI, and IT capital and operating savings of more than \$1.27M over 3 years when they implemented a VDI program with a data storage component.

The numbers clearly show that VDI provides an opportunity to consolidate resources and reduce the spend on data storage—freeing resources to support a BYOD program. Yet one-quarter of survey respondents are not considering VDI, even though the biggest perceived benefit is reduced costs.

VDI programs, data storage solutions, data consolidation, and data security are all pieces of the infrastructure and budget solution. Implementation can save the school districts money that can be put toward other infrastructure needs and provide the district with the foundation for a BYOD program. They all fit together to provide a comprehensive technology solution that will serve the district well now and in the future.

Nearly one-third of respondents are still in the research and planning phase of data storage, while 44% are investigating data consolidation and 33% are looking at data security. Now is the ideal time for these districts to investigate VDI and BYOD technology needs to ensure all of the systems are working together to maximize efficiency and budgets.



### Centralizing data storage

VDI presents the ability to consolidate infrastructure resources—rather than having 25 small servers, a district can have one big one. And consolidating data in one place with a robust data storage system is significantly more secure and reliable than storing sensitive information in schools throughout the district. This saves money, increases security, and ensures consistency. And, all devices on the network can be updated simultaneously by one individual.

“In a K-12 environment where educators and administrators wear multiple hats, VDI offers an opportunity for schools to increase efficiency, decrease costs, and use fewer resources by making rapid changes across thousands of desktops. The benefits of VDI allow schools to focus on their core mission: education and learning anytime, any place,” said Regina Kunkle, Vice President, State, Local, and Education, NetApp U.S. Public Sector.

VDI is simply more operationally efficient. But as school districts move in this direction, data storage is an important issue to consider—where the data will be housed, the most secure systems for use in schools, and present and future costs.

### CONCLUSIONS

K-12 school districts must continuously evolve and change—and all of the changes become a burden on IT staff. The right technologies reduce that burden and bring faster adoption of VDI/BYOD. These technologies have too many benefits to ignore:

- VDI and data storage solutions provide better protections for student information. Mobility solutions ensure security by allowing data to remain in one secure place.
- Data follows the student throughout their K-12 education, even as they switch schools, which increases the security and privacy around this data and ensures that student progress can move forward even across schools.
- Putting student data online, especially test scores, gives the school district the power to improve performance. They can quickly perform analytics needed to pinpoint educational issues—whether widespread challenges with curriculum or specific problems with a school or teacher—and get performance enhancements based on the data into the classroom quickly.

- Technology is proven to increase test scores and improve learning. BYOD and VDI programs support this critical outcome.
- School districts not only realize immediate cost savings with centralized management of data, they also realize additional cost savings when it comes time to perform updates and other system servicing on data storage and applications. And the reduced burden on the IT staff frees them to focus on supporting the education process.

### Getting started

Getting started with VDI and BYOD programs is easier than it may seem. A school district need not roll out to all locations at once. Pilot programs in one or two schools are a very effective way to test the systems and implementation process—at a relatively low investment. “Start small,” said Burwell. “You’ll see that zero to benefit is easy.”

In fact, once you establish your infrastructure, all you have to do to remain current with technology changes is to add new projects and applications. It’s easy to give your students the edge they need to succeed. The infrastructure is key.

“The sooner you implement these programs, the sooner you’ll see the benefits—increased test scores, improved security, and budget resources freed for infrastructure improvements,” said Kunkle.

The fact is BYOD, VDI, and virtual systems prepare students for success and save the schools money. Can you afford not to adopt these changes?

### ABOUT THE STUDY

The NetApp 2013 K-12 Education VDI & BYOD Online Survey explores the challenges, barriers, and concerns relative to VDI and BYOD for IT decision makers and influencers in the K-12 education marketplace. Schools represented 61% of respondents, school districts 36%, and those with a joint role 3%. Of the school districts represented, two out of three report an enrollment of 3,001-5,000 students. Most respondents describe their primary role as administrator, IT/MIS/IRM or teacher/instructor. Two out of three respondents anticipate their school/district will invest between \$20K and \$1M in technology over the next 12 to 18 months.

### ABOUT NETAPP

NetApp’s efficient, cost-effective data storage and management solutions meet education’s IT infrastructure needs. NetApp’s unified storage solutions, with superior storage efficiency, can help educational institutions manage data growth, comply with mandates, and meet Society for Laboratory Automation and Screening standards—all while lowering total cost of ownership. NetApp’s dedication to principles of simplicity, innovation, and customer success has made them one of the fastest-growing storage and data management providers today. For more information and case studies [about](#) NetApp’s BYOD and VDI solutions for schools, visit [netapp.com/edu](http://netapp.com/edu).

### ABOUT MARKET CONNECTIONS, INC.

Market Connections delivers actionable intelligence and insights that enable improved business performance and positioning for leading businesses, trade associations and the public sector. The custom market research firm is a sought-after authority on preferences, perceptions, and trends among the public sector and the contractors who serve them, offering deep domain expertise in information technology and telecommunications; healthcare; and education. For more information visit: [www.marketconnectionsinc.com](http://www.marketconnectionsinc.com).