

Lexmark in Education:

Schools Drive Savings and Student Achievement
with Innovative Testing and Grading Solution

Introduction

School systems across the U.S. are caught in a dilemma. Tighter budgets are forcing schools to reduce costs even as they embark on ambitious plans to boost the quality of their education. Meanwhile, federal monies can no longer be counted on to cover the shortfall. It is a time when educators and school officials agree that cuts are unavoidable, but to do it right, they must master a tough balancing act between their unwavering commitment to education and their inescapable fiscal realities.

Adding to the pressure is another reality – namely, the rising cost of education. In the last five years, per-student costs have risen 10% to nearly \$10,000 per student per year, according to the U.S. Department of Education. This unsettling trend has been driven in part by a series of mandates aimed at closing achievement gaps, preventing dropouts, and equitably serving more diverse student populations.

One of the ways that schools are meeting their education requirements is through better and more frequent testing, and to that end schools have widely adopted technologies like Optical Mark Recognition (OMR) to make the testing and grading process both versatile and efficient. The investment has come at a cost however, with schools spending more on specialized OMR “bubble sheets” along with equipment to scan and grade the completed test forms. The technology frequently leads to delays, sometimes lasting days, when schools transport sheets off-site for processing. Such bottlenecks prevent timely student interventions and course adjustments.

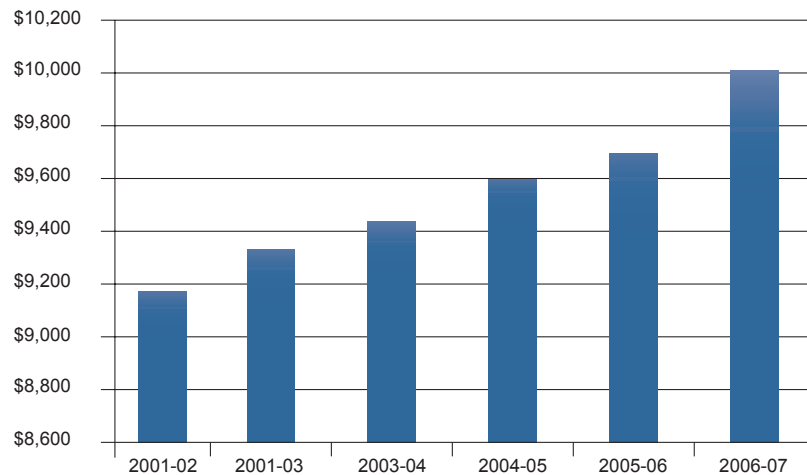


Figure 1. Per student expenditures (in constant 2007-08 dollars)

Smarter Spending

Sobering Lesson

- *Nationally, 79% of district leaders express concern that the economic downturn has impaired their ability to improve student achievement.¹*
- *43% of school districts reported budget cuts of 10% or less for this academic year, and 21% reported cuts of 11% to 25%.²*

The challenge for schools today is to get smarter about spending while refusing to compromise on educational standards. Mainstay Partners' study of school districts showed that it is indeed possible to accomplish these twin goals. The study showed that new testing and grading solutions can not only control operating and capital costs but actually enhance the educational process.

The new solutions target key sources of waste embedded in traditional student testing and grading programs:

- **Costly pre-printed bubble sheets for testing.** OMR bubble sheets are significantly more expensive than plain paper and are hard to personalize.
- **Off-site or inefficient test scanning and grading.** Many schools rely on central offices to process the sheets and distribute the results. Shipping the forms is costly and cause delays – particularly in school districts with high mobility rates – that impact student achievement. Others grade the sheets manually, a costly time sink for teachers.
- **Output device proliferation.** Over the years, most schools build up a hodgepodge of output devices, including different types of printers, scanners and copiers. The multiple standalone devices consume valuable desktop space, take more energy to run, and cost more to maintain.
- **Sub-optimal fleet management.** Faced with device proliferation, schools are invariably challenged to keep all the machines running in a cost-effective fashion. Inherent device inefficiencies, poor networking, multiple maintenance contracts, and sub-optimal consumables management all combine to keep costs high.

Add to this a host of other inefficient practices and it becomes apparent that schools can reap substantial savings by introducing solutions for tackling inefficiencies in testing and grading programs and the related output device infrastructure. In the sections that follow, we'll share how leading school districts are using Lexmark Testing and Grading Solutions to combat waste, realize cost savings, and help teachers and students accelerate the learning process.

¹ From a recent survey of school districts by the American Association of School Administrators (AASA).

² Same AASA survey.

Intelligent Move

“Our objective was to improve the entire testing experience for teachers, administrators, students, and parents. We have achieved that objective and more.”

— Andy Alvarado
Assistant Superintendent,
Educational Services
Golden Valley Unified
School District

School districts around the country are discovering a new, more efficient way to manage the student testing and grading function. Pioneered by Lexmark, the new solution combines high-efficiency printing and scanning technology with sophisticated software in a single, flexible, cost-effective testing and grading platform. With Lexmark Testing and Grading Solutions, districts have found a rich source of efficiency and productivity savings at a time they are needed most, and an innovative way to empower teachers with timely intelligence.

Adopted by school districts serving 4 million students nationwide, the latest Lexmark Testing and Grading Solutions leapfrog over traditional testing systems in terms of cost and efficiency. In the traditional environment, teachers administer tests by passing out pre-printed bubble sheets and either grading them manually or sending the tests off to be scanned and graded at a remote facility. Lexmark replaces the pre-printed forms with on-demand printing on plain paper; and it replaces off-site and manual grading with instant on-site scanning and grading using the same multifunction device that originally printed the tests.

The solution is fully networked, so all the devices work together and share a common, industry – proven application for recording the grades and analyzing and distributing the results. The software integrates with school’s existing student information systems, generating further efficiency gains. By connecting to these systems, teachers can create personalized test sheets that are “pre-slugged” with the student’s name, class and period. Results can be posted instantly to internal Web sites, electronic grade books or longitudinal reporting systems.

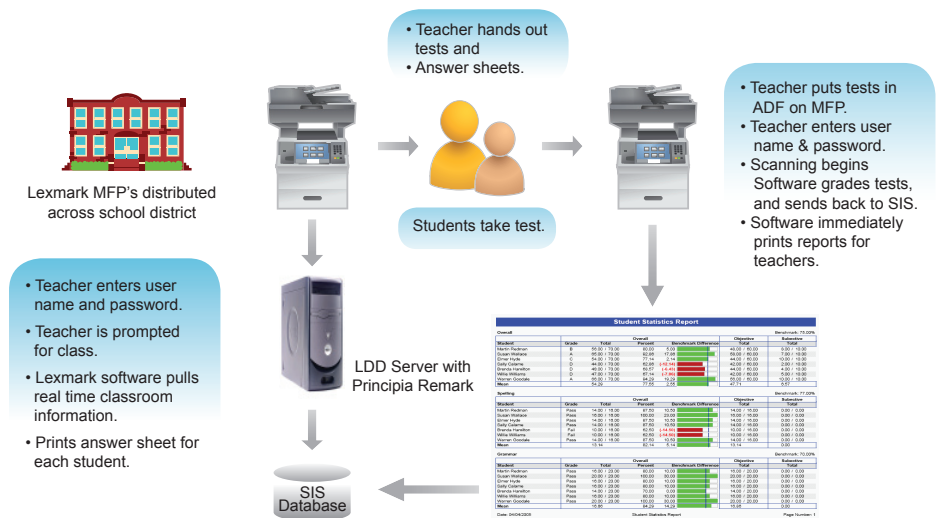


Figure 2. The Lexmark Testing and Grading Solution

The Solution in Action

What kinds of benefits are school districts actually seeing from implementing Lexmark Testing and Grading Solutions? To find out, Mainstay Partners looked at the following school districts that have deployed Lexmark solutions:

- Laredo Independent School District, Texas
- Mobile County Public School System, Alabama
- New York City Department of Education
- Prince George's County Public Schools, Maryland
- Roslyn Union Free School District, New York
- Spokane Public School District, Washington
- Spotsylvania County Public Schools, Virginia
- Washington County Public Schools, Maryland

The selection of schools represent a cross-section of institutions across the U.S., including small districts of just 25,000 students to New York City's public school system with 1.1 million students. Annual operating budgets at these institutions ranged from \$95 million to \$21.2 billion. Figures 3 and 4 show the student enrollment size and school budgets at the schools studied.

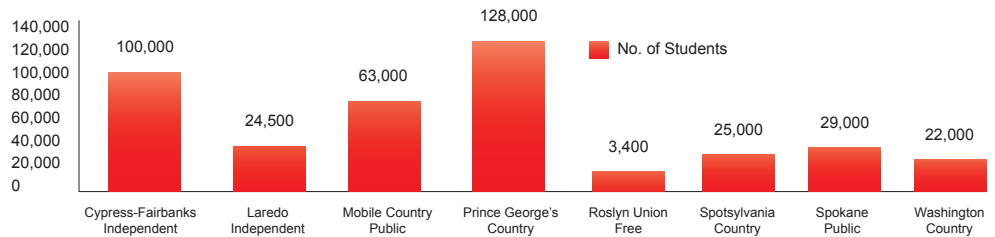


Figure 3: Vertical Case Studies: Number of Students per School District
(Note: New York City DOE with 1.1M students not shown)

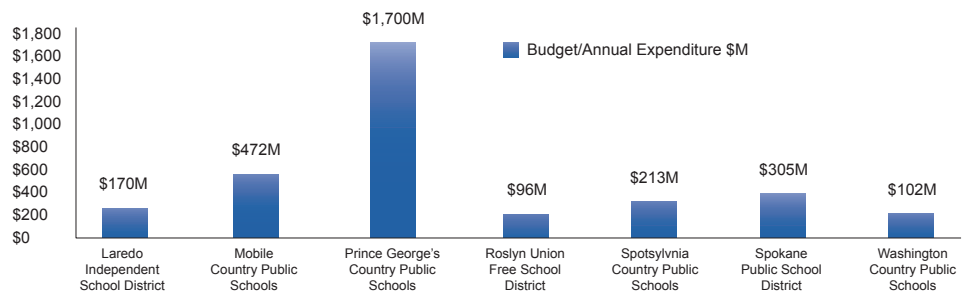


Figure 4: Lexmark Education Study: School Budgets
(Note: New York City Dept. of Education not shown)

Broad-based Benefits

At every school district, we found that the new solution is generating benefits that extend to a broad set of stakeholders:

- Teachers saw their testing-and-grading productivity soar as much as 90% after implementing the Lexmark solution, which automated the end-to-end process. They now see test results in minutes instead of hours or days, enabling faster interventions and making impromptu or daily assessments practical.
- Students are seeing similar reductions in wait times, helping them learn from the results while the subjects are top of mind. The solution also generates individualized student reports that improve school-home communication.
- School administrators and executives are seeing the positive impact of the Lexmark solution on their district's financial performance. On average, districts realized annual cost savings of \$200,000 by shifting to testing and grading solutions that eliminate pre-printed forms.
- IT departments are seeing lighter workloads as districts consolidate on fewer devices – typically 35% fewer – and implement pro-active maintenance programs.



Lexmark Testing and Grading Solutions Impact

The following sections dig deeper into the benefits achieved by the school districts we looked at in this study.

“Paper consumption plunged by 81%, to just 273,000 sheets monthly, from 1.5 million.”

— Dr. Edward A. Salina
Assistant Superintendent
Roslyn Union Free
School District

Driving Cost Avoidance and Savings

Across the board, the school systems in this study realized savings by switching to Lexmark MFPs, which consolidate the function of several devices in a single machine that costs less to purchase, consumes less toner and desk space, and requires less power to run. In four of the districts studied – in New York, Alabama, and Washington – schools reported hundreds of thousands of dollars in savings and cost avoidance.

- Mobile County Public School System saved \$200,000 by integrating printers, copiers, faxes, and scanners into multi-function printers
- Roslyn Free School District saved \$148,000 in consumables
- Spokane Public School District saved \$125,000 after expanding the solution to 34 elementary schools
- New York City Department of Education saved \$552,000 per year in energy costs

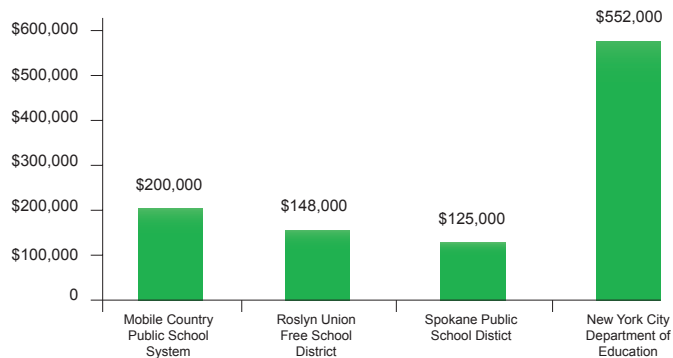


Figure 5. Average Annual Cost Savings and Avoidance

“The elegance of this entire system is its simplicity. From the teachers’ perspective, it is essentially a one button process. It works seamlessly.”

— Bill Flaherty
Assistant Superintendent
of Technology Services
Spotsylvania County
Public Schools

Faster Testing and Grading

While cost savings is a key motivator, officials said that faster grading and immediate access to results weighed equally in their decision to move to on-site, on-demand testing and grading solutions. “For the first time, teachers have total access to student information almost immediately,” said Bill Flaherty, Assistant Superintendent of Technology Services at Virginia’s Spotsylvania County Public Schools, which adopted Lexmark technology to speed grading and results distribution.

Districts are seeing faster grading because the technology gives teachers and administrators full control over the scoring process. Test forms never leave their possession and results are available in minutes. Completely eliminated are the delays built into old centralized grading systems, which typically require schools to send testing sheets off site and wait days for results. The delays prevent teachers from providing rapid feedback to students and parents.

The range of improvements reported by the schools surveyed is impressive:

- *One school saw grade-posting cycles accelerate from 10 days to minutes.*
- *The throughput boost made possible by the scanning and grading technology is giving one district the ability to grade 55,000 test sheets every 9 weeks*
- *Those same efficiencies are allowing another school system to process more than 1.6 million sheets per year.*
- *One school can now grade nearly 55,000 student test sheets every 9 weeks.*

*Evelyn Adams
Fourth Grade Teacher,
Carmody Hills Elementary
School:*

- *The number of students completing assigned math homework has gone from approximately 40% to 80%.*
- *The class average for math quizzes has gone from 50 – 60% the first week, to 70 – 85% in eight weeks.*

Using Lexmark MFP-based solutions, for example, teachers feed a stack of completed bubble test sheets into the same device they used earlier to print the tests. Software running on the local network scores tests in seconds, and ports the results into a student information system or Website minutes later. “Within 15 minutes of scanning test sheets, the data is in our STI™ student database and stakeholders can view test results on our Web site,” one teacher said.

Automated testing and grading solutions are giving teachers greater flexibility, too. With the power to prepare personalized “pre-slugged” bubble test sheets in minutes, teachers can deliver quizzes and tests at a moment’s notice and get near-real-time updates on student comprehension. “Teachers can prepare tests and quizzes on the fly, scan the completed sheets and review results immediately,” said Rolaetta Alford, the principal of a Maryland elementary school. “It took just 15 minutes for the teachers to get a handle on it.”

Moreover, by relieving teachers of the burden of manual test preparation and grading, the solution is giving teachers more time during the day to focus on education. “You’re looking at an 80% to 90% time savings,” said Evelyn Adams, a teacher at Prince George’s County Public Schools in Maryland. “That frees me up to spend time on things that make a difference in my students’ achievement.”

Boosting Achievement

While the shift to new MFP-based testing and grading solutions is giving teachers faster feedback on student performance, it’s what teachers do with that feedback that really makes a difference. Teachers say that by exposing learning gaps and class comprehension issues immediately, the new technology helps them provide one-on-one help right away and make rapid adjustments to curricula and course content.

In the schools surveyed, teachers said they are updating curriculum in days instead of weeks. Reporting tools built into the solution help the process along by quickly identifying gaps and trends in test results. Students, too, are getting grades back sooner, helping them understand their strengths and weaknesses while the concepts are still fresh in their minds.

At New York's Roslyn Union Free School District, paper consumption fell 81% – from 1.5 million to 273,000 sheets per month – after the district moved to Lexmark multifunction printers with a “secure print release” capability that scans and distributes documents electronically. In addition to slashing paper waste, the district is expected to cut its annual \$100,000 bill for printing, envelope stuffing and postage by 40%.

We have been able to implement two-sided answer sheets. That cuts my paper use in half – a tremendous paper savings for an elementary school.”

*– Evelyn Adams
Teacher
Carmody Hills
Elementary School*

The net effect: teachers are noticing a measurable improvement in student achievement as grading delays disappear and teachers become more closely attuned to students' academic needs on a test-by-test basis. Further helping the relationship are the productivity gains made possible by test automation, which teachers say is minimizing manual test-prepping and grading work, and allowing for more time for student interaction. At one school we studied, the number of students completing math homework nearly doubled after implementing the new testing and grading solution, and average scores on math quizzes soared.

Curbing Consumption

Environmental sustainability has emerged as a top priority at almost every educational institution we surveyed. Themes like waste reduction and energy conservation were not only taught in the classroom, but are now part of the business planning of school districts and an important strategy for stretching tight educational budgets. Printing operations emerged as a prime target at the schools we surveyed, with officials discovering they can trim waste and energy consumption by taking several basic steps:

- Phase out color inkjets in favor of monochrome laser printers that are cheaper to operate and use fewer “consumables” such as toner
- Consolidate devices by switching to multifunction printers that save space and reduce electricity usage
- Move to two-sided printing for high-volume jobs such as student test forms, cutting paper consumption in half

A majority of the schools in the survey stopped purchasing pre-printed test forms entirely by adopting on-demand plain-paper printing solutions. These schools are saving on storage space as well as the extra cost of pre-printed forms. Other schools are going one step further in battling waste by moving to electronic documents that can be emailed instead of printed.

Making the Grade

“Our relationship with Lexmark is a true, unique partnership. This was a huge high-profile project and the Lexmark team stayed onsite until everything was customized, tested, and fully operational. It has been a very rewarding experience for us.”

— Margaret Reed
Director of Information Services, Cypress-Fairbanks Independent School District

“Every vendor was willing to sell us hardware, but only Lexmark was able to develop a comprehensive long-term strategy that met our specific current and future needs.”

— Roy Lanier
Chief Technology Officer
Laredo Independent School District

As schools confront tougher economic times, many are discovering that new testing and grading solutions offer an effective way to deal with tighter budgets without compromising educational quality. Momentum is building for technology, pioneered by Lexmark, that target one of the largest sources of waste and inefficiencies in school systems today: the use of expensive pre-printed forms for bubble-sheet testing, slow off-site grading systems, and inefficient poorly managed output devices.

From New York City to Texas to Washington State, the school districts surveyed in this study successfully deployed Lexmark solutions to automate and accelerate the testing and grading process. The solutions combine networked multifunction printers with software for managing the entire process, from test-form creation, to scanning and grading, to analyzing and publishing test results.

These school districts are generating significant savings over a range of cost categories. All of the schools have eliminated pre-printed forms in favor of economical plain paper. They are also saving hundreds of thousands of dollars per year by switching to networked multifunction printers that cost less to own and operate, and easily integrate and share data with student information systems. Furthermore, the solutions are helping teachers avoid hundreds of hours a year in manual grading chores while speeding access to test results—a powerful formula for boosting academic achievement.

For more information about Lexmark Testing and Grading Solution visit:
http://www1.lexmark.com/content/en_us/solutions/industry_solutions/education/education_overview.shtml