A lesson in how we learn

Helping teachers learn more from students, and students learn more from assessments.

It's 10 a.m. in a fourth-grade classroom when the teacher announces a test. The kids all cheer.

She steps over to a multifunction device and with a few quick selections, produces a stack of fresh, personalized assessments and hands them out for the students to complete. A short time later, she collects the finished assessments, feeds the stack back into the same multifunction device, and within moments, they're digitally scored, charted and presented to her in a color-coded graphic table.

Everyone eagerly awaits the results as she reviews them with each pupil. She shows them how they performed and where they have opportunities to improve. She also notices 80% of her students missed question No. 14 and makes a mental note to investigate. Next time, she'll do better—and so will they.

Why? Because when you lift the data off the page, analyze it and turn it into actionable next steps, you raise the potential in the classroom.

It could be the norm someday. Right now, it's happening in one school, in partnership with Xerox researchers.

Big things happen when scientists team up with grade school teachers.

It might be the last place you'd think of when it comes to high-tech R&D. Yet Xerox scientists collaborated with a Webster, N.Y., school's third- and fourth-grade teachers.

Using an Extensible Interface Platform (EIP) enabled multifunction printer, the research team has gone beyond printing and created a prototype they call the Xerox® Educational Assessment Management System (XEAMS).

The system lets teachers select, personalize, print, scan and score assessments in a fraction of the time it used to take. Even better, the results are compiled into data-rich reports that reveal classroom trends. That's because XEAMS can read written marks, from numbers and letters to lines that connect objects to free-form marks like circles and slashes—which makes it far more versatile than old systems that could only read filled-in bubbles.

"One of the key technologies behind XEAMS is known as mark lifting," said Eric Hamby, Ph.D., Principal Scientist at the Xerox Research Center Webster and the project's co-leader. "That's the ability to process, reconstitute, analyze and manage marks on paper, whether handmade or machine-made."

The graphic nature of the scoring system makes it fun and instructive to share results with kids, according to Dewitt Road School fourth-grade teacher Julie Ryan. "It's so helpful for them to have that visual. The scoring technology is an education tool in and of itself."

Dewitt Road School fourth-grade teacher Jen DellaPietra says the extra time saved with the experimental scoring system means more to devote to planning. "We can do more research, develop more instructional units. We have more time to plan lessons that are fun and interactive."

"It's a core Xerox® technology that's part of our rich tradition of helping customers make the transition from paper to digital," Hamby said.

Why elementary school?

The early years of education set the tone for a student's performance through high school and college. It's critical to track progress during those years, but there's never been an easy way to analyze assessment results in a much broader context.

That's the challenge the research team from Xerox tackled. They called the superintendent and asked to talk to the school about how children learn. From that discussion, the researchers started to approach those needs.

"Our team went into Dewitt Road School in Webster and worked with teachers side by side for months," said Hamby. "They studied teachers' processes and developed a way to improve the way assessments were scored." This is the essence of Xerox's ethnographic-driven Customer Led Innovation approach.

The result: XEAMS.

Saving time and gaining insight.

The system has now scored more than one million questions— and saved teachers countless hours.

"Before, it would take 45 minutes to grade assessments. Now it's 10 minutes," said fourth-grade teacher Julie Ryan.

But even more important, the system makes analysis easier, too—and presents results in a way that kids love.

"It helps everybody see success," said fourth-grade teacher Jen DellaPietra. "It helps students target things they need to work on—and see how far they've come."

Parents like the feedback, too, said teachers.

Teaching that's more targeted.

"We're always looking for ways to individualize our teaching for each child, so this system is a huge benefit," third-grade teacher Kristine Skarzynski said.

Katie Davis added that teachers work to prepare kids to be critical thinkers. "They're going to need to solve bigger problems," third-grade teacher Davis said.

The Xerox team hopes to help more kids prepare for solving bigger problems, as it anticipates expanding into multiple schools in multiple districts in Monroe County next year, according to Hamby.

Research from the perspective of people's needs.

How do people work? What slows them down? How do they think and learn and share?

The core of Xerox research is about what it means to be human.

Hamby echoed that sentiment. "XEAMS demonstrates the power of bringing together educators and scientists to tackle the long-standing problem of helping teachers address individual student needs in the classroom," he said.

And it all starts in elementary school.