GETTING SMART ON

K-12 DATA INTEROPERABILITY

Introduction

By Marisa Kaplan and Tony Wan

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WHAT DOES IT TAKE TO MAKE INTEROPERABILITY WORK IN K-12 EDUCATION?

Interoperability, defined dryly, is the seamless, secure and controlled exchange of data between different applications and technologies. The term is a mouthful, yet the concept enables many conveniences we take for granted. It allows, for instance, pharmacists to verify and prepare your medications after your doctor's visit. It allows companies to pay employees via direct deposit, and for you to pay others via mobile apps or online banking services.

In education, however, interoperability has lagged behind other industries and services. Data is fragmented across different systems that don't "speak" to one another. This means records are not easily transferable between tools used within the same school or district. Many times, products don't even record student or achievement data in the same format, which makes it difficult to compile data into one place.

School leaders and educators who want to view data from multiple tools on one dashboard often have to repeatedly enter the data by hand, which can be time consuming. In addition, entering student information, setting up class rosters and helping students log in to online tools only adds work to a teacher's crammed day.

Some edtech companies are taking notice and experimenting with potential solutions such as aligning to a particular set of interoperability standards. But customer demand is what will ultimately drive change—until teachers and administrators voice their concerns en masse, these interoperability issues will likely remain a headache.

So what does it take to make interoperability work in education? Over the past six months, the EdSurge Research team has been collaborating with Getting Smart to dig into how companies and schools are trying to connect the data pipes. In this Smart Bundle, you'll find case studies from the perspective of educators and administrators, as well as a series of profiles that share how companies are thinking, planning and guiding their product development process to address these user needs.
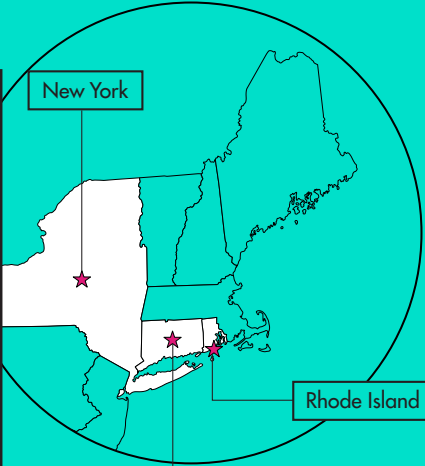
How Achievement First is Creating an Interoperable Ecosystem

By Getting Smart Staff

Achievement First operates a network of 32 high-performing, college-preparatory, K-12 public charter schools in Connecticut, Rhode Island and New York City. In keeping with its name, the network is centered on a goal of outstanding student achievement. Its rigorous standards, high-quality curriculum and ongoing professional development for teachers serve to support this goal. Teachers regularly analyze student data to drive daily instruction and long-term planning, and an emphasis is placed on building strong relationships with students, parents and guardians.

ACHIEVEMENT FIRST

A Getting Smart Data Interoperability Case Study

New York

Rhode Island

Connecticut

Twitter: @achievement1st
Website: achievementfirst.org

Since the opening of its initial school, Amistad Academy, in 1999, the network has grown to three states, opening elementary, middle and high schools centered on its "REACH" core values: Respect, Enthusiasm, Achievement, Citizenship and Hard Work. Students are admitted on a lottery basis, with an average of 10 applications received for each seat.

BAKED-IN INNOVATION

Schools are staffed with operations, logistics and technology teams that enable teaching and learning staff to focus on curriculum development and delivery, assessment, and professional learning. Three years ago, the network launched Greenfield, a new school model that emphasizes self-motivated learning with greater access to technology, smaller group instruction, and a variety of enrichment activities. (By the 2017–18 academic year, three network schools will follow this model).

Archana Parab, Database Architect, leads a "small and mighty" team of developers and database staff who build and refine data connections and design solutions to meet the entire network's technical needs. She explained that Achievement First employs a variety of assessment platforms: Illuminate is in place for benchmark assessments, while STAR assessments, along with a whole host of other digital reading platforms, are used for reading. The network also piloted and uses Cortex, a next-generation learning platform developed by InnovateEDU.

"Our team believes very strongly in being able to build and maintain your own tools—and it has created a massive competitive advantage for us, as that kind of internal capability is still unusual among charter schools."

Nowhere is this more evident than in the network's Greenfield program, which demonstrates how schools can be built from scratch. For example, through Illuminate, Greenfield teachers are disseminating weekly quizzes that offer a variety of benchmark assessments. Lisa Minott, Senior Director of Greenfield Technology, noted that it enables her team "to intervene before an issue becomes a crisis, and we can also subdivide into a week-by-week basis, focusing on two to three items for mastery." Those assessments feed into Cortex. This interoperability between systems means that interventions are structured and meaningful, and address key gap areas while giving teachers actionable data.

"You take something huge like moving a kid across a couple of grade levels in a year, and turn that into a feasible accomplishment," added Anthony Nevico, the former Senior Director of Systems and Data who now works for InnovateEDU.

TECHNOLOGY SUPPORTS THE PERSONALIZED LEARNING MODEL

While Achievement First's existing assessment tools currently do not adapt to students' responses in real time, they offer varied assessments in which each student can move at his or her own pace.

"We do a lot of reporting for various blocks throughout the day: science, humanities, math, etc.—and from that we gather a suite of reports on a specific trend line," Minott said. "This enables us to set rigorous yet appropriate goals for every student in terms of proficiency." The ability to pull data together in an interoperable way means that this trend line deeply informs the core work of the team.

While overall student growth is charted by analytics obtained from weekly assessments, teachers in the Greenfield model also rely upon the Cortex platform to drive personalized learning.

"With our 1:1 model, all Greenfield students have access to a Chromebook, and specific times when they're learning science, English, and other topics," Minott explained. "They log into Cortex, where we've laid out core content and several 'go deeper' modules, which enable fast-moving students to explore a given topic further. Each student encounters a playlist of digital content and activities—whether those involve text, multimedia or simulations—that have been curated alongside a study guide with questions and prompts. If they pass, they can move onto the other playlist." Students see their progress in real time, driving engagement in the content and exploration of passion-driven and interest-driven deeper dives. Teachers can understand through the data not only if a student is learning, but how.

Students' needs are met at all ends of the spectrum. "For those reading below grade level, we can customize down to the student's level, so that on the surface it looks the same—they're covering the same topic as their peers—yet it's a way to reach students with challenges where they are," Minott said. "The module then serves as a benefit rather than a roadblock."

MANY TOUCHPOINTS, ONE POWERFUL COMMUNITY

Many school leaders talk about an unwavering commitment to their students. What that means and how it can be put into practice varies widely, of course. Just what would happen if every adult staff member was committed to student success on a daily basis?

"Our Greenfield model schools are set up so that students have goal coaches and goal teams; for example, every teacher in the building is assigned somewhere between 10 and 16 students for whom they are a goal coach," Minott said. "This means that they work with this particular cohort of kids both academically and personally. They share experiences, personal histories, and stories. It's enabled us to build a real, tangible community around each student. They meet every day for 15 minutes." This goal team data is able to live side-by-side with the interoperable assessment data in Cortex, allowing teachers and staff to get a holistic picture of the student's academic performance.

The Greenfield model uses a "dream team" concept. Instead of a typical report card, students are asked to select a group of adults such as parents, grandparents, guardians, clergy members or coaches who are important role models to them. Students as young as five (kindergarten students) then present to their dream teams.

Students in the Greenfield model also receive weekly progress reports, stating their proficiencies and how far they may be from an academic target. In the network's other schools, traditional report cards and a report card night held in the schools pull a child's support team into the conversation. The ability to have an interoperable solution in Cortex, which captures data from disparate systems into one view, allows for more real-time weekly updates for students, teachers, parents and the goal team to assess where a student is and how far he or she has to go. This inherently shifts the dynamic from teacher-led to student-led, and leads to more informed decision-making.

CONSTRUCTING AN ECOSYSTEM

Whether in the network's classic schools or in its Greenfield model, innovation continues to be rolled out at Achievement First. "This year, we launched a platform called Curriculum Hub. It's a custom piece of software that provides daily lesson resources that create scope, sequence and scaffolding for teachers. Instead of spending time figuring out the basics (how to write a lesson and bring the content alive with certain nuances), the software allows teachers to go a lot deeper and drive mastery of content."

The answer doesn't lie in a single solution, Nevico said.

"There's no secret sauce in terms of platform, reports or software; it's about creating an interoperable ecosystem, developing the right habits and empowering teachers to accomplish lofty goals."

Lessons Learned While Creating Change in Providence Public Schools

By Getting Smart Staff

As the largest school district in Rhode Island, Providence Public Schools makes up 25% of the state's entire elementary and secondary student population. Nearly 1,900 teaching and learning staff are employed in 42 schools, each equipped with various types of technology tools (42 in all). By the 2013-14 academic year, the large, distributed academic environment had begun to embrace personalized learning (PL) as part of a statewide initiative developed by the governor's Office of Innovation and the (now former) Commissioner of Education for Rhode Island.

PROVIDENCE PUBLIC SCHOOLS

A Getting Smart Data Interoperability Case Study

Providence, Rhode Island

PROVIDENCE PUBLIC SCHOOLS AT A GLANCE

Students served:
25,000

District schools:
42 schools total
22 of which are elementary schools

Free and reduced lunch population:
79%

Classroom size:
26 students per class

Twitter: @pvdschools
Website: Providenceschools.org

Yet challenges presented themselves in a number of areas. There were gaps in student performance, a lack of strategic direction, inconsistent technology sourcing and selection, and little emphasis on data interoperability—some of which persist today. The district has aimed to make significant strides in moving toward a streamlined PL experience for its students and faculty.

Cameron Berube, who began serving as Director of Curriculum and Instruction in 2015, was part of the design team to move the district toward PL. She oversees all content areas, curriculum, instructional practices and assessment, working alongside the district's Superintendent and Chief Academic Officer to engage school leaders and teachers.

LOOKING AHEAD WHILE INSTITUTING CHANGE

As part of this broader team, Berube developed a contextualized strategic direction for the district in creating PL standards that include implementing culturally responsive pedagogy, bolstering teachers' efforts toward blended practices, accommodating a rising English language learning population, and instituting best practices for all learners. A five-year plan was developed, with input from parents, students and community organizations.

While the plan was constructed with a sense of urgency, it wasn't intended to be hastily implemented.

"My belief about change is it's a long, slow process that requires input and buy-in from students and teachers," Berube said. "That's what creates long-lasting change. We need to provide methodical, purposeful support for good instruction – and it has to happen side by side with our teachers."

Building what Berube calls a "behind-the-scenes" structure to support PL has involved investigating devices and systems and finding innovators and early adopters among the faculty. "Putting tools in teachers' hands to make their jobs easier improves learning."

In partnership with InnovateEDU and Rhode Island's Highlander Institute, leaders from Providence Public Schools agreed to participate in an implementation study during the 2016-17 academic year for a PL tool called Cortex. The study would engage technical staff as well as coaches and programmatic personnel. Teachers were trained in anticipation of a September launch.

Laura Jackson, the Institute's EdTechRI Testbed manager who worked on the project, said: "There's no other district like Providence within the state; more and more they're being recognized as a leader in blended and personalized learning, with a demonstrated willingness to pivot toward reimagined physical space, small-group instruction and leveraging digital content."

A compressed timeline led to technical challenges in terms of data transfer and configuration required for the launch. Miscommunication occurred between the programmatic and technical teams, which were separately in contact with the support team at Cortex. The tool's two-way API also raised red flags for district leaders in terms of privacy—and it wasn't compliant with Providence's existing Student Information System.

ACQUIRING TECH AND PROCESSES THAT SUPPORT ALL LEARNERS

Could the approach to a rollout have gone more smoothly? Sure. In a fair retrospective, however, one must acknowledge the broader challenges involved. Like many public school districts across the U.S., Providence has budget constraints that impact human resources.

"Our technology office hasn't added staff; nor have we increased the size of our research planning and accountability team," Berube said.

Without a dedicated staff member to oversee a complex implementation such as in the Cortex pilot, it's easy to see how well-intentioned plans could get forestalled. Constant collaboration is difficult to achieve when staff members are already overloaded in their day-to-day roles.

Providence Public Schools also has a higher than average mobility rate for the state, which has a potentially disruptive effect on the classroom environment and demonstrates the need for automated, real-time data transfers so that student rosters and associated accounts are updated regularly. Berube cited it as a reason for adopting recognized standards, such as the Ed-Fi Data Standard, moving forward.

"Data interoperability is an imperative for multiple reasons. Regarding the high mobility rate within Providence Public Schools, it allows for students to have immediate access to the curricular tools and resources in their home school at the moment of entry, which ensures that there is no loss in learning time." – Cameron Berube, Director of Curriculum and Instruction

What does the future hold for Providence Public Schools? If existing progress is any indication, there will be even greater autonomy in school management, enhanced data access and interoperability, and significantly improved student learning outcomes.

Download the full
Providence Public
Schools Case Study

Originally posted
on May 16, 2017
GettingSmart.com

On the Road to Interoperability with Denver Public Schools

By Getting Smart Staff

With a student enrollment edging ever closer to six figures, Denver Public Schools (DPS) is Colorado's largest school district. More than 4,300 teachers instruct students in elementary, middle and high schools, along with a mix of non-traditional and charter schools run by three main charter management organizations: Strive, KIPP, and Denver Sciences Schools of Technology.

DENVER PUBLIC SCHOOLS

A Getting Smart Data Interoperability Case Study

Denver, Colorado
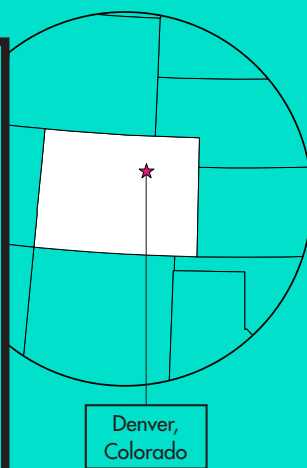
DENVER PUBLIC SCHOOLS AT A GLANCE

Students served:
91,429

District schools:
199 schools total, of which 93 are elementary schools, and 18 are K-8 schools.

Free and reduced lunch population:
67.3%

Twitter: @DPSNewsNow
Website: dpsk12.org

As one of the nation's largest and most diverse districts, DPS faces numerous challenges. It must meet the needs of a student population whose linguistic, ethnic and socioeconomic backgrounds vary widely—no small feat for a small network of schools, let alone the largest in the state. Meanwhile, a centralized management team must support and oversee the efforts of a distributed staff whose instructional methods range from more conventional classroom environments to the earliest stages of adoption of a competency-based education model.

ENABLING FLEXIBILITY AT SCALE

Josh Allen, Director of IT for the district, serves as an architect and strategist for all systems on both the academic and operational sides. Understanding and being able to accommodate the needs of various schools calls for an approach beyond the typical IT role, which is often more rigid in nature with a standardized slant.

"We are highly flexible; of our 190 schools, assessment and curriculum can be selected by school leaders for the specific populations they're educating," Allen said. "Denver empowers schools to operate within their own preferences, down to the device level and selection of applications. We've formalized this process with our board."

DPS's technology department manages the Student Information System for all schools in order to maintain compliance with the Department of Education; however, Allen acknowledges the Department of Technology must work closely with schools for their technology and application selections.

Assessment is a similar and interrelated story. Tim Leddy, Senior Product Manager, serves as project manager for the district's various academic systems. He manages a team of product managers who define DPS's technology requirements, following the development of prototypes or design documents, teacher interviews and/or focus groups.

EVALUATING AND SUPPORTING AN ARRAY OF TECHNOLOGIES

District-wide assessment platform Illuminate DnA will serve as DPS's data assessment management platform. A majority of schools will employ it in the coming academic year, with some using Achievement Network ("A-Net"), which also incorporates coaching features.

Leddy cites the flexibility of Illuminate as an advantage for DPS faculty. "Our teachers can log in after a lesson for a quick assessment, but the platform also enables end-of-course assessments, interim assessments and just about anything in between."

As of the beginning of the 2016–17 academic year, 61 of the 142 district-managed schools had rolled out Illuminate DnA, along with a number of assessment platforms. (The adoption was the result of a successful five-school pilot last year). Leddy emphasizes that while most schools have chosen to adopt Illuminate or A-Net, they are also able to opt out and select their own platforms.

From an IT perspective, Allen added, data access and interoperability standards were considered from the very beginning of the district's RFP process for a new LMS. They used IMS Global standards, as integrating past data into Schoology was an important criterion prior to moving forward.

Allen said the district has been testing out various forms of data-driven instruction with varying degrees of success. "Some of our schools and faculty take to it well, but there's high variability," Leddy agreed.

MANAGING A COMPLEX ASSESSMENT ENVIRONMENT

Kristen Maxey-Moore, Director of Assessment, leads DPS's Assessment, Research and Evaluation (ARE) Department, and is responsible for setting district-wide strategy related to the evaluation of students' academic performance.

In order to have a common data set for adjusting instruction, she explains, the district administers a minimum of three common formative assessments (one per trimester). DPS assessments include:

- iStation as the district-supported READ Act assessment in K–5 schools
- Scholastic Reading Inventory (SRI), used in grades six and up
- iReady, STAR, and Dynamic Indicators of Basic Early Literacy Skills (DIBELS), used by schools that have opted out of the first two options

GOVERNANCE AND THE ROAD TO INTEROPERABILITY

DPS has created a charter governing committee on interoperability so that time-sensitive, fully-sortable data inputs can be stored in its data warehouse, regardless of the platform or application initially used to record the data.

"One difficulty we have is not having one standardized method of bringing data into our data warehouse," Allen said. "When schools make individual choices, the district simply doesn't have a single universal contract with regard to data ingestion."

It's an uncomfortable place to be, he admits, for a district that, due to its sheer size, stands to benefit greatly from improved interoperability.

"We've been partnering with a cohort of school leaders across the country on standards development, working with IMS Global, Ed-Fi, and InnovateEDU, among others, to determine how we can best interface with providers so that schools get the benefit of looking at data for adaptive assessments and time-dimensioned student progress."

While startup edtech firms are typically nimbler in their approaches to data storing, sharing and interoperability, Allen said, working with the "Goliaths" among educational publishers, like Pearson or Houghton Mifflin, requires a fair amount of effort on the school's behalf in order to source data.

"Along with other districts across the nation, we at DPS need to be able to easily import information critical to supporting our students' progress," Allen said. "That may involve telling providers that 'as soon as we get this done in the evening, we also need to be able to extract it into our data warehouse,' and have that actually transpire in real time."

Download the full
Denver Public
Schools Case Study

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GettingSmart.com

Is Meaning Lost When Data Is Exported? Why Reasoning Mind Takes a 'Wait and See' Approach

By Marisa Kaplan, EdSurge

If you take data out of context, does it lose its meaning? This question constantly plagues Steven Gaudino, VP of Product Management at Reasoning Mind.

The Houston-based nonprofit organization develops online blended learning programs that can be used as core or supplemental curriculum in math classrooms, or to guide small group work in after-school programs. The nonprofit has been researching and iterating its math methodology since 2000, and its products have been used in classrooms since 2005. Currently, Reasoning Mind offers five programs that serve over 140,000 students in Pre-K through seventh grade and provides professional development to help teachers understand the organization's approach to mathematics.

The programs collect a variety of data, from usage to performance, which Gaudino believes can guide instruction to target specific student needs. But he worries that data loses its meaning when it is shrunken down, exported and fed into other systems. He realizes that some administrators desire to see the data in a single dashboard, but questions whether combining it will help students learn. "Centralizing information in itself is not necessarily going to improve educational outcomes for students," he says.

LOSING CONTEXT WHEN EXPORTING DATA

Gaudino says that Reasoning Mind's programs use artificial intelligence to decide the sequence of content each student sees and to help teachers guide instruction; therefore data collection is a fundamental component of its system.

The reporting functionalities were quite limited at first. The programs could display high-level metrics such as the percentage of problems that students solved correctly, but teachers had to manually input that data into their own Excel spreadsheets. It perturbed the product development team and spurred action. "Simultaneously impressed with their efforts and horrified that it was necessary, we made it a priority to get them reports that better aligned with their needs," Gaudino explains. This realization led to the development of a new set of reports designed to give teachers more specific information that would guide instruction. The new reports allow a teacher can click on a cell to see problems a student solved incorrectly and review the student's work. They also provide notifications to follow up with specific students during the class period.

Today, the system collects typical data points including student roster information (name, grade and class) and usage data, such as how long a student has spent on a particular activity. But Gaudino is most excited about a more complex type of data. For example, Reasoning Mind's programs involve open-response questions that the system can analyze to identify which part of a problem led to student error; the system

then uses that information to generate problems tailored to specific misunderstandings a student has. Using student performance data, the system can also identify which students may be best able to mentor others, and connect online tutors for specific students that need additional support.

The level of complexity in the data collected by Reasoning Mind's programs makes it impossible to export every data point to another system. "We can't feed every solution to every problem a student has done to some other database," says Gaudino. "It would be too detailed." The challenge for Reasoning Mind is figuring out which data points are the most meaningful and actionable for teachers.

"We can share the amount of time spent online, the percentage of problems solved correctly or topics that a student struggled on. But you lose some context as soon as you leave the Reasoning Mind environment," Gaudino explains. The richness of data is lost when it is exported to a separate system, and the organization fears that teachers won't be able to use it to inform instruction. This fear has prompted apprehension about prioritizing data export capabilities.

RESOLVING INTEROPERABILITY ISSUES DISTRICT-BY-DISTRICT

Reasoning Mind has worked with its customers to address data sharing and rostering requests, which have accelerated over the past five years, according to Gaudino. To date, this has been a district-by-district effort and the organization has not created a consistent approach. Gaudino, who has been with the organization for over ten years, speculates that at some point, the industry will consolidate, adopting a common set of standards or reporting dashboard that will help make data sharing more meaningful. Until that happens, Reasoning Mind will support districts on a case-by-case basis.

Many districts are interested in optimizing student roster data, which includes the administrative information that allows teachers to create class accounts in the system. In particular, there's been greater demand for creating single sign-on solutions that allow students to log in to different programs using the same credentials, observes William McGuinness, director of product management at Reasoning Mind. Several solutions have emerged from companies including Clever, Microsoft and Google. (Reasoning Mind will be launching integration with Clever in the fall of 2017.)

The organization has also experimented with building its own API to meet a district's needs. During the 2014-2015 school year, as part of a blended learning initiative led by LEAP Innovations, Chicago Public Schools (CPS) piloted Reasoning Mind's Foundations curriculum with grades two through five. During the pilot, CPS requested that Reasoning Mind build an API to support single sign on with Engrade, the district's learning management system.

McGuinness recalls that it wasn't difficult for the team to build the API. The greatest challenge was figuring out what data to send and how it will impact student learning. "We can do some exploratory work and come up with something that spits out data within a few weeks, but is that the best use of our time?" he asks. "Or do we invest in working with districts to build something more integrated with support for teachers in actually using the data?"

There was also a more fundamental logistics issue: every school system is different, and building APIs for each one is not feasible. "What you need in order for an API to work is for all districts to use the same set of standards to connect to vendors, but that is technically complicated."

WATCHFULLY WAITING FOR CONSOLIDATION

For now, the organization is taking a "wait and see" approach to interoperability. The product team is currently investigating the Learning Tools Interoperability (LTI) standards from IMS Global Learning Consortium.

"Currently, things are pretty disparate, and since our goal is to meet the most needs, we're going to be watchful," Gaudino explains. He believes that unification around a set of standards will happen naturally out of efficiency and convenience, but he cautions that it can't stop there because above all else, interoperability must improve teaching and learning—and to do that, the data must be meaningful.

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Zeal CEO: Want to Make Data Actionable? Start with Building the Right Culture

By Kelly Blair, EdSurge

John Danner, CEO of the online math tutoring tool Zeal, sees interoperability as a problem for edtech, but doesn't believe there is a good solution. "The solution that's been proposed is to roll up data from all systems and present it in a dashboard. Because the data isn't well-aligned, it's a 'garbage in, garbage out' problem," he says. What Danner means: if the data is inaccurate or inconsistent when it's entered, then it would be difficult for educators or anyone to derive useful insights.

Prior to starting Zeal, which claims to serve 25,000 students each week, Danner was the co-founder and CEO of Rocketship Education, a technology-rich charter management organization based in northern California. That experience allows him to speak from the perspective of both practitioner and entrepreneur. And he knows firsthand how administrators and product developers both struggle with making data portable and actionable.

At Rocketship, teachers used a variety of digital math and reading tools to provide individualized instruction for students in computer labs everyday. Danner's experience taught him that building a grand, unified dashboard that combines data from multiple programs has its obstacles.

Interpretations of learning standards across different educational tools are inconsistent; each program may define success differently. The criteria by which a student has "mastered" a topic may be different for Zeal, DreamBox Learning, ST Math or any number of math programs.

At Zeal, the general belief is that data is most impactful when it is in the hands of teachers in the most simplified format. Danner says, "If they see it and understand it, they can act on it."

PROTECTING TEACHERS' TIME THROUGH CLEVER INTEGRATION

Zeal's interoperability efforts can be segmented into importing and exporting data. For Zeal, importing refers to the rostering and login processes for teachers, which include entering student information, setting up and managing class accounts and helping students get started using the tool on a device.

Danner has witnessed many teachers spend too much time setting up student accounts and helping them manage passwords. This is a poor use of valuable instruction time. "I'd rather see teachers spending their time working with students than manually entering data," he explains. The problem is compounded when students move from one class to another, which happens frequently through the school year.

One way that Zeal has addressed this issue is by integrating with Clever, an edtech company that syncs with a district's student information system (SIS) to automate student login and rostering processes. This way, rostering data is automatically updated for teachers and the tools they use.

For schools that don't use Clever, teachers must manually enter all student data, or send Zeal a CSV file. And every time there's a change in the class roster, they must manually make the change or notify the company.
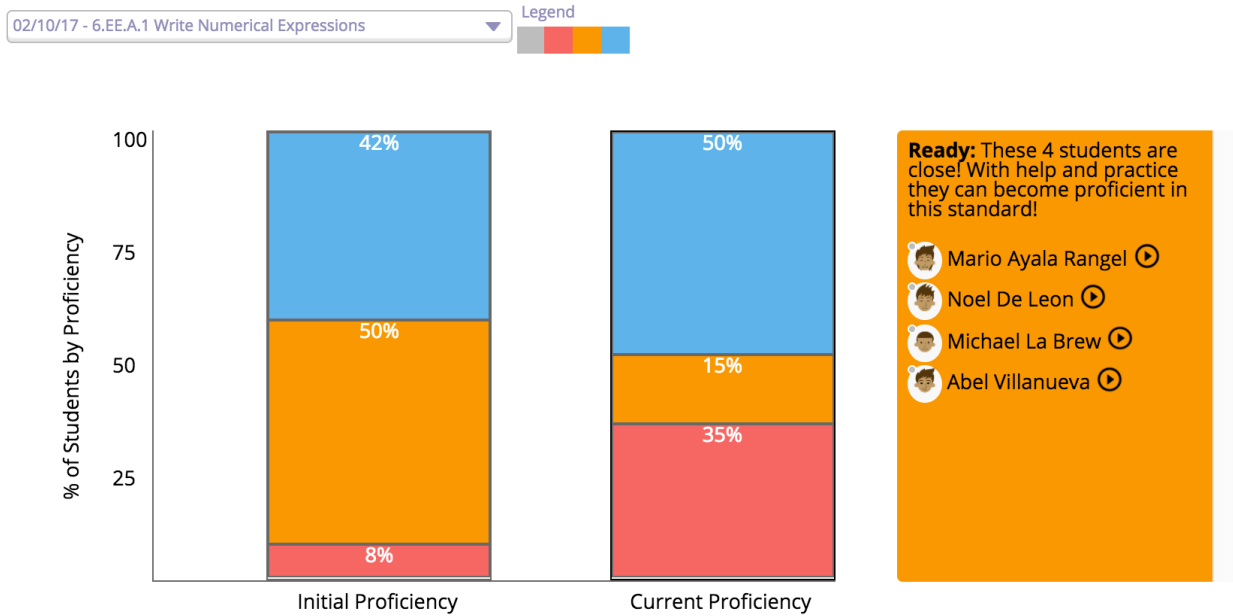
HELPING TEACHERS TAKE ACTION

Danner also knows that some administrators want the flexibility to move all student data in and out of the different tools in their digital learning environments—not just names and rosters. Ideally, they want to see all of a student's data (administrative, usage and performance) from different tools in one place. The convenience of a single dashboard can give administrators better insights into what products are working (or not) and can inform educators about which students need support, or are ready to move ahead.

However, Danner isn't convinced that investing time and money on untangling the web of knots that prevent student achievement data from being passed between tools will positively impact learning outcomes. Improving data sharing between tools will make operations more efficient for administrators, but he believes that it will not increase the effectiveness of instruction.
For Danner, there's a more fundamental issue that must be addressed before access: building a culture and habit of looking at data—and doing something with it. Unless teachers look at data and take action, it doesn't matter whether the data is in one place or in many different places. Danner believes that helping teachers develop habits for using data is more valuable than helping administrators collect data in one place.

The company's best method to help teachers use data to take action is figuring out how to present the right information quickly and clearly. Zeal currently offers a teacher dashboard that displays student progress on assigned standards, highlighting students below grade level and showing which pre-skills to focus on. This information helps teachers identify student readiness for specific skills and make decisions about what to teach next and whether whole or small group instruction makes the most sense.

02/10/17 - 6.EE.A.1 Write Numerical Expressions ▼	Legend

Initial Proficiency: 42% (blue), 50% (orange), 8% (red)
Current Proficiency: 50% (blue), 15% (orange), 35% (red)

% of Students by Proficiency (y-axis: 0–100)

Ready: These 4 students are close! With help and practice they can become proficient in this standard!

- Mario Ayala Rangel ▶
- Noel De Leon ▶
- Michael La Brew ▶
- Abel Villanueva ▶

Though Zeal isn't currently focusing on data sharing, Danner isn't opposed to supporting other methods of exporting student data if customers express a real need. Zeal has already developed a custom API to help schools and districts export data from the tool, but only a dozen or so use it.

Alpha Public Schools, a charter school network based in San Jose, Calif. uses the API to import the three basic data types (usage, proficiency and growth data) into Tableau, a tool that helps users visualize and analyze data. Alpha's use case is not common. In Danner's view, just because a district has access to student data with a product does not mean that teachers will use it to change or improve instruction. Until that's the case, the company does not plan to invest significant time or resources in improving these efforts.

WHAT'S UP NEXT

Instead of interoperability, Danner wants to focus on using data in other ways. For example, he is curious how much Zeal impacts student growth on assessments such as NWEA MAP and Smarter Balanced. The company is currently working with Empirical Education and KIPP Los Angeles to conduct a validation study over the course of one semester. Empirical Education is looking for meaningful correlations between Zeal's raw usage data, KIPP LA's student rosters and NWEA MAP scores. "We want to figure out what growth we caused on metrics our users trust." That being said, Danner says educators should be wary of using performance data from Zeal, or any other edtech program, as a substitute for rigorous assessment data.

Danner believes that if they can prove that student achievement in Zeal is predictive of student achievement on these tests, then district administrators might actually use the data to make changes to teaching and learning throughout the year, which is his endgame.

In the meantime, Zeal will continue to focus on new ways to help teachers use achievement data to improve student learning offline. "Teachers are the only ones who can make something of the data," says Danner. "They're the only ones who matter."

Data Sharing Hasn't Been a Concern for Most Newsela Customers - But Super Users Want More

By Kelly Blair, EdSurge

Improving how student data is shared across systems has been a slowly evolving concern for Newsela since its launch in 2013. The New York City-based startup offers a reading tool that lets students read nonfiction and news articles at different levels, and take short quizzes to demonstrate their understanding.

"We want to be a part of the conversation around student reading progress at every school," explains Dan Cogan-Drew, Chief Product Officer and co-founder at Newsela.

Formerly the director of digital learning at Achievement First, a tech-rich charter school system, Cogan-Drew understands that data from curriculum tools can be critical to conversations about improving students' literacy levels. Helping teachers and administrators visualize and analyze that data is a start. But surprisingly, he says he has not seen many requests from customers to make Newsela's data compatible with other data systems that their schools use.

Educators can currently access student performance data on Newsela in a two ways: they can download the raw data into a CSV file, or use a data dashboard, called a "binder," which offers interactive graphs and tables that allow teachers, principals and administrators to see and sort how students are doing.

Student	Reading Level ▾	Percentile	Articles Viewed	Avg. Time in Article	Quiz Avg.	Write Avg.	Avg. Annotations Per Article	Skills Mastery 1 2 3 4 5 6 7 8
Yavniel, Xenia	11.2 ± 0.2	99th	91		96.4% 77 Taken			
Gedera, Elena	10.1 ± 0.2	99th	80	0:30 min 40:06 min Total	94.5% 64 Taken	2.0 1 Graded	0.1 6 Total	
Dado, Burgos	8.1 ± 0.2	56th	121	0:29 min 59:26 min Total	60.4% 12 Taken	2.5 2 Graded	0.8 91 Total	
Kumar, Gayathri	7.9 ± 0.1	85th	112	0:52 min 1:36:47 hr Total	71.3% 95 Taken	2.6 3 Graded	0.3 32 Total	
Fournier, Robert	7.9 ± 0.2	97th	76	0:00 min 0:29 min Total	86.1% 72 Taken	2.5 2 Graded		
Weber, Elijah	7.9 ± 0.2	95th	84	0:19 min 25:58 min Total	85.8% 72 Taken		0.0 2 Total	
Kvin, Petrica	7.7 ± 0.2	86th	120	0:03 min 5:42 min Total	80.9% 76 Taken			
Simon, Michael	7.7 ± 0.2	95th	78	0:05 min 5:59 min Total	83.9% 73 Taken		0.1 4 Total	

Teacher Binder

Principal Binder

For most teachers, says Cogan-Drew, these features suffice. There have been a few one-off data integration requests over the years. But his experience has taught him that most schools and districts don't have the time, resources or technical know-how to connect and analyze student performance data in a large-scale, systematic way.

Yet recently, Newsela's "super users," including Summit Public Schools and Aspire Public Schools, have asked the company to develop a more thorough and consistent way to export data. These two tech-savvy charter management organizations, based in the San Francisco Bay Area, employ data teams to aggregate the information into data visualization dashboards for teachers and administrators.

In the fall of 2016, Newsela devised a way to send secure files via secure file transfer protocol (SFTP) every night. These files contain specific student performance data points that play a key role in helping educators understand where their students are—and how to best provide additional support.

This data transfer method isn't flashy: Newsela's product development team writes custom code that automatically sends data in the format requested by the school clients. Cogan-Drew says this approach is sustainable for the time being, and he is confident that the current system can handle providing an automated report to every one of Newsela's customers. He expects to hear more customers demand this data export feature in the near future. "When we see more adoption, we will work on automating and generalizing the approach. The tipping point will be when it is more efficient for us to build tools that give more control to administrative customers than it is to handle their requests manually," he explains.

What Summit and Aspire do with this nightly export file will help Newsela understand whether it should develop a more sophisticated way to transfer data. Before investing product and engineering resources to build better tools to share data, Cogan-Drew wants to see evidence that the information is being used in actionable ways. The dashboard currently available to educators through the Newsela platform already "visualizes the data in a way that is actionable to teachers," he claims. He does not want to build different custom data integrations for each individual customer.

His team has considered the possibility of aligning Newsela's data to existing data standards, but he is hesitant to fully commit for now. Cogan-Drew says there is a "tug-of-war" around whose data standards or API will be the most widely adopted; it doesn't make sense, after all, to align one's product to a standard that only a few others adopt. He envisions that down the road, depending on what teachers, principals and district administrators need, Newsela may build its own API that others can access to pull data.

Until then, the company plans to maintain its current data sharing practices for the majority of its customers, and watch closely how Aspire and Summit leverage data from the nightly file transfers.

"Right now [schools are] not asking us to feed data into another system. But I can foresee a day like that," says Cogan-Drew.

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Illuminate Education Shines Light on Growing Need for Better Data Sharing

By Kelly Blair, EdSurge

"We are an all data system," says Mark Walls, Chief Product Officer at Illuminate Education. "We'll build out whatever data set you want."

That's a bold offer, but one that the Irvine, Calif.-based company says it can deliver to its customers, which include more than 1,500 districts serving roughly 5.5 million students. Illuminate's three core products aim to help educators manage their students' learning experience through tools that capture and visualize different types of data, from attendance and assessment to behavior, demographics and special needs.

To provide this service, Illuminate needs to receive student data from other tools such as student information systems (SIS) and assessment providers.

For Illuminate, the ability to openly share data between schools and tools isn't just a nice-to-have. It's a core product feature. "We've been talking about interoperability since the beginning in 2009. It's a key tenet of what we do," Walls explained.

AS EDTECH INDUSTRY GROWS, SO DO DATA CONVERSATIONS

"The conversation around interoperability has shifted over the past decade," Walls notes. Back in 2009, data interoperability wasn't a high priority—simply because there weren't many data management products in the market. "There were fewer players in the field," he says.

At the time, Illuminate only had to figure out how to import data from a few tools.

Yet as the edtech industry has grown, so too has the number of digital tools. And as schools adopt more technologies, their data systems have become more complex. Educators today want data to be able to travel seamlessly between the specialized tools in their increasingly complex learning environments.

Illuminate was founded to serve this demand, says Walls. "Data sharing is what we do, so there aren't really product development trade offs."

DATA PIPELINE DECISIONS

Requests related to data integration usually come from the school. For example, a district that uses PowerSchool's student information system, and Illuminate to deliver assessments, will want the two systems to be connected so that the assessment data automatically shows up in PowerSchool. Teachers shouldn't have to do manual data entry work to make this happen.

"No one uses the word 'Interoperability,'" Walls says, "but that's what they [educators] are asking for."

For Walls' team, there were several approaches to improving how data is shared between edtech tools. They could:

1. adopt an open data sharing initiative like the Schools Interoperability Framework (SIF);
2. manually set up custom processes for importing and exporting files to each tool a customer uses;
3. build an application program interface (API) that customers can use to access Illuminate's data.

Adopting a common open data standard like SIF was the most appealing option to Walls. In theory, if every edtech company invested the time and resources to do this alignment, data could flow between products seamlessly and require little additional investment from developers. It would be a win-win situation.

Yet the issue with SIF was less about getting companies onboard, and more about its adoption in schools and districts. According to Walls, SIF proved too complicated for administrators and educators to use. For instance, in order for data to transfer between SIF-aligned systems, a district needed a specific server, specific software, and manual coordination of all the products to determine which information needed to flow in which direction and at what time.

A highly trained staff was required to pull off the technical feat. "Districts had to have IT staff with the appropriate skill level to do all of these things," says Walls. "What we were seeing was that districts were asking their teachers and administrative clerks to fill these roles." Since schools and districts didn't have the right personnel and resources to use SIF effectively, he believed the initiative wasn't worth investing in.

The second option would be a costly compromise. Theoretically, the company could work with each customer to set up custom processes to pass data files between Illuminate and the other tools used by a school. However, since each tool reported data differently, the amount of time it would take to provide this custom service for each customer's unique suite of products would quickly become too costly for the team to sustain.

In 2011, the company decided on the third option: building its own API that would allow other vendors to get data from Illuminate whenever they wanted it. (Think of an API as a mall directory that people use to figure out what data points are available and how to find them.)
Through Illuminate's API, schools and other product vendors could, using a few lines of code, collect the data they want. This would save the company from having to spend time transferring data between systems themselves.

Illuminate released its API, yet Walls realized this wasn't a perfect solution. Even though many schools will ask vendors to talk to one another to make their data compatible, sometimes those conversations stall because both vendors have their own APIs, which don't play nicely with each other.

Walls recognizes that this is a problematic situation, and that Illuminate's API is only a partial solution to interoperability. But it was a step in the right direction. "We understand that this API didn't adequately address the idea of interoperability for some customers," he acknowledges.

ONE STANDARD TO RULE THEM ALL?

According to Walls and many other industry experts, the answer to the interoperability problem rests upon having a single industry standard API, built according to open standards such as SIF 3.0 or Ed-Fi. In fact, he recalls that right around 2011 Illuminate was having conversations with Ed-Fi Alliance saying, "We need a standard API in education."

The first step, according to Walls, is for educators to mobilize behind the issue of interoperability so that it gets attention and gains traction. Then, likely with the support of a foundation, a small working group should be created. Ideally it would include four or five vendors with significant experience dealing with data interoperability, and a handful of administrators from across the country who are well-versed in data issues.

The group should determine the three or four most common use cases for data sharing in the field and begin building, or working with an existing standardized API around only those needs. After these few use cases are built out, companies should test them and iterate to determine how they can be improved for users. "We don't need to solve all of the problems," Walls says. "Let us sit at a table with the right people and solve one small problem really well."

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DIY or Buy? How Lexia Learning is Revisiting Data Integration

By Kelly Blair, EdSurge

Rob Paushter has been fiddling with ways to make data more easily accessible for his customers for more than seven years. "It all started back in 2010 when we spent time and money on an initiative that we thought would help customers," said the Vice President of Product Development at Lexia Learning. His company develops curriculum and assessment tools for elementary school students and currently serves over two million users. One of its most popular tools, Lexia Reading Core5, provides adaptive content in foundational reading skills.

His buyers were district administrators, many of whom agreed that different EdTech products should be able to share data with one another. As schools adopt a dizzying array of digital services, the ability to collect data from different tools into one place could allow educators to better understand how products are used, and whether they are delivering results.

To allow for this flow of data, EdTech tools needed to connect with one another. Yet that requires them to be built according to a common set of data standards. Imagine a set of Legos, and EdTech tools as individual pieces. If each piece had pegs of different sizes, or pegs that were spaced irregularly, they wouldn't be of much use. Individual blocks fit because they are designed around a set of standards and specifications.

In 2010, the standard that everyone was eyeing was the Schools Interoperability Framework (SIF), an open data standard designed by the Access For Learning Community. Companies were encouraged to apply the standard for a variety of tasks, such as importing student data like names and grade levels, along with rostering, the technical term for creating student accounts (so they can log in to use a tool), and assigning each student to a particular group or teacher.

Paushter heard buyers begin to ask whether tools were SIF-compliant. Eventually this became a prerequisite for schools and districts to consider purchasing a product. "We wanted our accounts and rostering systems to be as easy to use as possible," said Paushter, "and sales were requiring it, so we aligned our roster data to SIF."

By making this change, the company hoped it could help educators seamlessly move accounts and rostering data between the different tools they were using. This required other products used by its school clients to be aligned to SIF as well, but the team believed it was worth the effort. If the data could move between systems without having to be manually updated, this would save teachers time and reduce human error, improving accuracy.

After aligning to SIF in 2010, the Lexia team kept an eye on usage to see if there was a positive impact on users' experience, as promised. What they found was that the schools and districts were not taking advantage of the benefits of a common data standard.

While the district and school purchasers had asked for tools to be SIF compliant, they didn't actually have the in-house technical expertise to connect these tools together. "It was too complicated for people to use," said Paushter. Rostering using the SIF standard required a high level of technical skill and coordination between many different systems, so there were few people who could implement it effectively.

"We realized then it was not going to take off because people weren't using it," said Paushter. As a result, development for open data sharing stalled at Lexia.

REVISITING DATA INTEGRATION—THIS TIME, WITH SUPPORT

Between 2013 and 2014, the company revisited data sharing as a priority. This time, the demand came not as a result of a sales need, as it had been with SIF, but rather to support the product.

Lexia's Reading Core5 attempts to predict a student's achievement level and differentiate the sequence of content that he or she receives. In order to do so, the tool needs to know the student's grade level. This usually required that someone at a school or district import the data themselves by uploading a CSV file. These administrators would often call Lexia's support team for help with this manual import process.

This approach took off for some larger districts that had the resources, but it wasn't working for the masses. "We knew this approach was not going to scale and it would also introduce data quality issues that impact a key product feature," said Paushter.

In 2015, Lexia turned to Clever, an EdTech company that provides an API that connects with student information systems to help schools and companies keep student rostering data in sync.

In addition, Clever also offers a single sign-on solution so that students can log into different EdTech tools—including Lexia's—with a QR code. This proved immensely useful for Paushter, whose team had been looking for a way to "streamline the rostering and login processes so that students could get right in and use it."

THE CONSTANT JUGGLING OF COMPETING PRIORITIES

For many companies, the decision between building a solution in-house or paying another company for outside services boils down to which product development needs are prioritized—and whether the team can devote enough people (in this case, engineers) to the problem. As a digital content provider, should Lexia commit its limited resources to fine-tuning its curricular tools and features, or focus on improving data interoperability issues?

With the student rostering problem, the company made the choice to use (and pay) Clever. Other data issues remain: Lexia has heard from customers who want the company to be able to export data on how students are using the product.
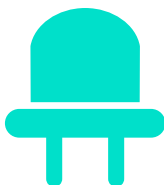
"We are making progress constantly," Paushter said, "but the question is really, 'Do users feel like we're making enough progress fast enough?'" In the fray of competing initiatives for content and assessment tools, it's up to customers to raise their voices if they want more advanced data sharing capabilities to become a priority at Lexia.

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