

GETTING SMART ON



TOMORROW'S
CLASSROOM:
FREE INNOVATIVE
TOOLS, RESOURCES
& APPS

IN PARTNERSHIP WITH:



PUBLISHED BY:



Introduction

Lucy Kosturko, Research Scientist,
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4 Strategies to Create Tomorrow's Classroom

The vision for tomorrow's classroom looks nothing like the antiquated stereotype of students sitting in rows, passively listening to a lecture followed by rote memorization tasks from a dusty, used textbook, some students nodding their heads, other heads nodding off. In many schools, the old model already seems quaint and ineffective. "In some classrooms," the late Yogi Berra might have said, "tomorrow got here yesterday."

Innovation Never Stops

Out-of-the-box teaching tools are becoming increasingly obsolete. Instead, educators are creating their own and adapting existing creation/productivity resources to engage students in higher-order thinking and providing authentic, real-world activities to develop essential skills for lifelong learning and personalizing instruction to fit individual needs.

And the innovation never stops. With each new school year comes new technology, new budgets, new policies, and, most importantly, new students. This means what worked last year will likely need to be redesigned. As a result, strict, scripted curricula with a one-size-fits-all approach not only ignore the reality of our diverse classrooms but they begin to look stale before they're unwrapped. While the adjective "old-school" may be enjoying some recent popularity as a rough synonym for "quality," "rigor," and "efficiency," the term has little relevance to the classroom.

To invert a quote from the sage Mr. Berra, old-school approaches have begun to look "over before they're over."

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How Developers Can Help

So what can developers of educational resources do to serve educators? A first step is to design for flexibility. Teachers don't need a resource to teach for them, any more than a doctor needs a resource to speak with her patients or a lawyer needs a resource to draft his arguments. Our standards for teacher training and accreditation exist for a reason.

Nonetheless, teaching well is demanding work, and flexible tools can enhance the performance of even the most skilled practitioners by helping create learning experiences that simply did not exist in the past, much like the way MRI procedures have enhanced (but not replaced) the work of skilled surgeons.

It's crucial for developers to consider all constraints present in the classroom and design with the kind of foresight described in the [Great App Checklist](#), which appears in our recently published [Mobile Learning: A Handbook for Developers, Educators, and Learners](#):

- **Student ability:** Does the resource support differentiation?
- **Student needs:** Is the resource appropriate for English Language Learners and students with visual or hearing impairments?
- **Student engagement:** Will the resource charge students to engage in higher-order thinking: creativity, collaboration/communication, critical thinking, problem solving, etc.
- **Student access:** Will the resource work on a variety of devices (e.g., iPads, laptops, desktops)? Is the resource beneficial to a classroom with only one computer?

Build Your Dream School

Keeping these goals and constraints in mind, imagine building your dream school from the ground up. Imagine leading a grassroots effort equipped with 14 of the state's most distinguished educators to create the ultimate education experience by meeting the personal needs of each student to create an environment no kit or out-of-the-box curriculum could ever come close to emulating.

Where would you start?

That's exactly the question Erica Prentice of Envision Science Academy found herself trying to answer last year. In early 2014, Erica was the newly-hired Curriculum Coordinator for Envision, and Year 1 was set to launch in August. She and her team of administrators and 14 classroom teachers (selected from more than 1,000 applicants) were charged with developing an unconventional curriculum guided by the [school's mission](#): "Provide innovative instruction through experiential learning with a focus on STEAM in order to prepare elementary and middle school students to compete, lead, and excel in the global marketplace." Because this is a charter school, Erica notes, State and Common Core Standards dictated what needed to be taught, but the mission was to manifest how. And that was the greatest challenge.

Using the [7e instructional model](#), Erica and her fellow teachers needed something more than a generic, prepackaged curriculum; they needed an approach that inspired inquiry, demanded higher-order thinking and collaboration, and, most of all, allowed teachers the autonomy to meet the individual needs of their students. This was something they needed to design entirely from scratch, and that's exactly what these passionate educators set out to do.

"By first quarter, instruction was amazing," Erica says, "but the problem was time. Our teachers were coming in at 5 a.m. and some weren't leaving until 8 p.m. But that's what the stakeholders wanted, so we couldn't cut corners. We were creating everything from the ground up, and it took so much time." In an effort to relieve her valiant troops, Erica searched for supplemental resources. Concerned that the products would either not align with Envision's mission or break its budget, she soon found an unexpected source of relief: [SAS Curriculum Pathways](#).

“There was nothing else out there anywhere close to SAS Curriculum Pathways in terms of quality, ease of access, and standards alignment... that would have been in our budget for year one,” Erica notes. “The vast number of resources and the thoughtful design for flexibility allow us to pick and chose what we want, feel safe and confident that we’re bringing reliable information to our students, and provide opportunities we wouldn’t have been able to deliver otherwise.”

Started in the late 1990’s, [SAS Curriculum Pathways](#) has grown into a repository of 1,500+ resources designed to supplement classroom instruction by engaging students in meaningful learning experiences that foster a deep, robust understanding of concepts. Best of all, SAS Curriculum Pathways is provided at no cost to educators and students around the world.

Stimulate Student and Teacher Creativity

From individual lessons to innovative tools and apps, this expansive collection “helped us build the philosophy [of Envision] without being a restricted curriculum” that runs the risk of stifling teacher creativity and autonomy. With SAS Curriculum Pathways, educators can [create compelling problem-based learning scenarios](#) and [strategically target instruction using formative assessment data](#) to provide additional insight into the strengths and weaknesses of individual students. Unlike the traditional classroom where students sit in rows passively listening to a lecture, these more dynamic and personalized experiences—complemented by the latest technologies—encourage and [develop learners that are self-regulated and prepared for today’s workplace](#).

“As a new, grassroots charter school with lofty ambitions to improve education and create students who are going to be globally competitive and change the world,” Erica explains, “it’s so nice to have resources such as SAS Curriculum Pathways that are available for free.”

Although this story might differ in many ways from that of your school, Envision shares the same fundamental goal with most educational establishments: to steadfastly provide a quality education to all students. Envision also faces the same constraints as other schools: diverse student population and limited budget. SAS Curriculum Pathways was built to meet these fundamental challenges [and to provide learning experiences that engage all students—regardless of technological or budgetary constraints](#).

There’s no need to imagine yourself in Erica Prentice’s shoes; as an educator you’re already wearing them. Equipped with quality educational resources from a source like SAS Curriculum Pathways, you’re ready to create tomorrow’s classroom today...for free!

5 Projects for Your PBL Classroom This Year

Lucy Kosturko, Research Scientist, SAS Curriculum Pathways

I run. By no means do I call myself a “runner,” but I enter races now and then. That means I train—a couple of miles on weekdays, long runs on the weekend. Some training runs are fast and enjoyable; most are slow and sluggish. Come race day, though, I’m quickly out of the gates, annihilating my training pace as if I could run for days. Why? The obvious answer is adrenaline. But what makes a race different? What gets that juice flowing?

Cheering crowds around each corner. Audience and purpose. The finish line.

A race has *meaning*.

Meaningful Assignments

This concept of meaning also applies in the classroom. Completing a writing assignment for a teacher (audience) and getting a grade (purpose) is like a training run. There might be some exceptional essays, but most will lack passion. Research shows that providing students with a purpose (other than getting a grade) and an audience (other than their teacher) [significantly improves the quality of their work across multiple dimensions](#).

Now consider problem-based learning, or similarly, [project-based learning \(PBL\)](#). PBL contextualizes learning and gives it greater purpose. Students must acquire content knowledge themselves, not through the less-engaging method of direct instruction. Thus, students guide their own learning and add their own meaning and experiences by digging into the material and actively engaging with the content. More importantly, students, not teachers, learn to answer the dreaded question: When will we ever use this stuff?

PBL Lessons

Devising PBL lessons takes determination and a lot of time managing several moving parts. Teachers must put a lot on the line to engage students in a multi-day PBL lesson and some of the most effective ones can take weeks to complete.

Now consider planning. Teachers must first conceptualize the problem or project, which is more complex than it sounds. [Essential PBL elements](#), according to the [Buck Institute for Education](#), include authenticity, student autonomy and choice, optimal challenge, and sustained inquiry (i.e., identifying a problem that “involves an active, in-depth process over time, in which students generate questions, find and use resources, ask further questions, and develop their own answers”).

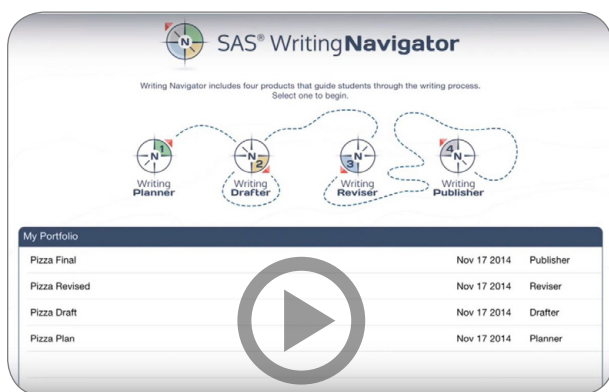
Next, teachers must identify the components. What tools and resources should be available to the students? Which elements should the kids explore and find? How do you balance autonomy and choice while curating resources sufficient to challenge students without overwhelming them? Where do you find such resources?

In sum, planning a PBL lesson is intimidating.

PBL Resources

To reduce that intimidation, [SAS Curriculum Pathways](#) provides a free, one-stop shop for supplementing PBL lessons. From complete lessons to interactive tools and resources, the product is a PBL gold mine. You'll find more than 1,250 PBL ideas and hundreds of standards-aligned PBL lessons in the five core disciplines, each [equipped with guides](#) that include learning objectives, assessment rubrics and keys, and a detailed procedure.

For more about Writing Navigator, watch this iOS App Preview on YouTube.

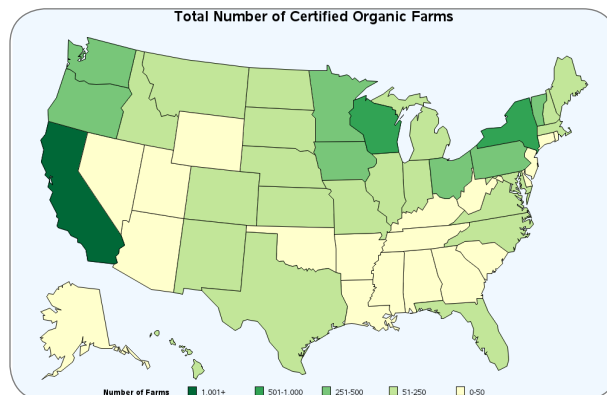


Take a look at this jazzy lesson on [Structure and Form in Sonnets, Ballads, and the Blues](#). In this project, students gain an understanding of poetic structure, devices, and themes by assuming the role of a composer. Pre-made handouts guide students as they establish background knowledge, define key terms, and explore a vetted list of research websites. Students even take a Blues Road Trip while listening to original pieces and reading biographical sketches of essential musicians.

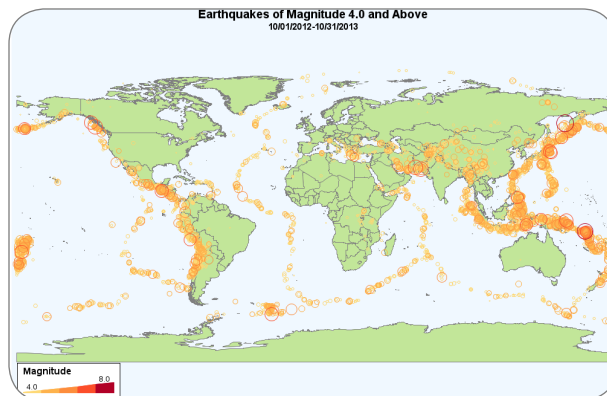
Amped-up on their research and adrenalized by self-reflection, students rip on digital Gibson guitars in apps like GarageBand and tell their own stories. And remember, this is only one of the hundreds of PBL lessons ready to plug and play in any classroom.

Have your own creative ideas? [Curriculum Pathways](#) also has supplemental tools and resources. Here's a small sample:

- **Write Your Congressman.** You're concerned about the water quality in a local stream. Your community has several manufacturing plants, but which plant is doing the most harm? To identify the culprit, use the [Stream Ecology Virtual Lab](#), part of a series of laboratory simulations that help build STEM expertise. Then open [Writing Navigator](#) and compose a letter to your local congressman with recommendations based on your findings.
- **Homesteading Hal.** Your neighbor, an aspiring organic farmer, is ready to leave city life behind, buy some land, and open his own organic farm. Where? He'd love your advice. Using the [Organic Farms in the U.S. data set](#) available through [Data Depot](#), a repository of more than 50 cleaned, downloadable data sets, create a heat map to help Sam make his decision. Other available resources include blank PDF maps of the U.S. in the [Interactive Atlas](#) and [Gloss](#), a mobile app for creating pictures and marking up PDFs.



- **Food for Thought.** Your local grocery store would like to create a public service announcement about the average price of food. Consulting the [Cost of Food at Home data set](#) in [Data Depot](#), create an infographic using [Canva](#) and graphically display what adult men, adult women, and a family of four can expect to pay monthly for food.
- **Shake It Off.** Several earthquakes occurred from 2012-2013; the Academy of Seismologists wants to know why. Map the earthquakes by using the [Interactive Atlas](#) (available in English and [Spanish](#)) and the data set on [Earthquakes in Data Depot](#). Are there patterns? If so, can you explain them? Finally, using [Writing Navigator](#), write a report for the seismologists explaining your analysis utilizing evidence from your map.



PBL and Long-term Impact

Problem and project-based learning lessons stay with students for years. They talk about them with friends and family. In the classroom or on the track, training exercises are easy to forget. But the races, the runs to which we attach meaning and purpose, the ones with something at stake—these stay with us forever and expand our understanding of who we are and what we can become.

Training versus racing: It's the difference, as E.B. White says in another context, "between planetary light and the combustion of stars."

Information is the Key to Data-Driven Teaching

Lucy Kosturka, Research Scientist, SAS Curriculum Pathways

Data provides us with evidence to guide future actions. An [estimated](#) 46 million people rang in January 2014 by seeking guidance from a smartphone app that gathers health and fitness data. That's one-third of all U.S. smartphone owners. Quantifying our weight-loss activities helps motivate these efforts and also pinpoints which actions seem to correlate with our goals. With weight loss, it's relatively simple: *if x, then y*. If you burn more calories than you consume, you'll lose weight. Gather data on calories going in and out, use this *information* to make decisions (e.g., padlock your refrigerator) and you're set.

Data and Personalized Learning

Data also helps guide educators. The more they know about a student's strengths and weaknesses, the better they can tailor instruction to fit her unique needs for guidance and support. The [Office of Education Technology](#) suggests data points "provide teachers with just-in-time feedback on progress toward mastery of content and allow educators to personalize learning pathways for their students." Informed by the relevant data, teachers can, ideally, provide a student with the support she needs at the precise moment she needs it and in the specific formats she requires.

Unfortunately, the formula for academic achievement looks nothing like the simple *if x, then y*. With education the x represents an ever-expanding host of interconnected factors: parental involvement, parent education, socioeconomic status, early exposure to math and reading, spatial reasoning skills, reading skills, self-regulatory skills, self-efficacy, growth mindset, access to technology... And as research continues to expand, so does the list of dependent variables that affect overall academic achievement. Only in the past decade or so, for example, did we begin to call for increased student access [to the Internet in school](#).

The quality of a student's education is multifaceted, intricate, and interdependent. While high-stakes, summative assessments are often the focus of student evaluation and school accountability, they tend to provide only a peek into students' academic performance. In other words, when making informed decisions about a child's education, data collection is much more complicated than tracking calories burned versus calories consumed. It's easier to get skinny than it is to get smart.

From Data to Information

To paint a comprehensive digital picture of a student's academic profile, one would have to collect far more data than mere mortals could evaluate. In other words, we'd have a deluge of data but no *information*; a series of numbers but no actionable conclusions; chaos without [Edward Lorenz's theory](#) to help us recognize the data's underlying order. Too often the result is not enlightened action but paralysis. After creating daily assessments and then administering, collecting, and organizing the data, teachers have little time left for critical analysis and even less for integrating lessons-learned into instruction.

Thank goodness for computers: collecting, organizing, analyzing, and displaying data is what they do best. Let's walk through some daily, data-driven instruction made easy for one of the most important skills students learn during their K-12 education: reading comprehension.

Running Records

For early reading instruction, elementary school teachers frequently use running records that are viewed as a particularly informative data point. In fact, the most effective reading teachers report using running records in their day-to-day instruction. In addition, research consistently supports their impact on early literacy achievement. The breadth of data yielded by running records and other tools (such as comprehension assessments) allows instructors to make informed decisions about specific components of reading that need targeted instruction, the student's independent and instructional reading levels, and how to form reading groups for guided reading.

However, conducting and collecting running records for an entire class can be time-consuming, rendering them almost impractical in today's busy classroom. Teachers must sit one-on-one with each student, listen as they read aloud and jot down any errors or other behaviors without asking them to stop, slow down, or otherwise stray from their natural reading cadence. After completing this cumbersome, error-prone activity, the teacher sums up the errors, calculates a series of formulae, and analyzes the data by piecing together the various components. Based on the analysis, the teacher is finally ready to make informed judgments about the best instructional course of action for the student.

Phew. One student down, 25 to go. Even the most well-intentioned, well-organized teacher will struggle to consistently make strategic, data-driven instructional decisions.

Running Record

Name: *Gally Student* Word Count: *175*

Title: *lava's colorful lava* Lexile® Level: *400L*

Accuracy Rate: *85%* Error Rate: *15%* Self-Correction Rate: *14%*

Line	Error	Count		MSV
		S	C	
1		11	1	M
2		1		WV
3				
4				
5				
6		1		
7				
8				WV
9				
10				
11		1		
12				
13		1		✓
14				
15				
16				

*m=3
v=2*

VS.

SAS Reading Recs

Wildcats
Class Code: *xxx4uc5b*

Dashboard Assignments

Assignment 1 - Julia

Errors: 0 Self-corrections: 0

Completed: 04/13/2014

Painting My Room

My name is Nyla. I love my bedroom. But the yellow walls are scratched and dirty.

I asked my mom if we could paint the walls. She said, "Yes." Then I asked her if I could choose the color. She said I could.

She took me to a paint store. We bought paint brushes and supplies. I looked at paint charts.

They showed different colors. I looked at blues, greens, and pinks. I selected purple. That is my favorite color.

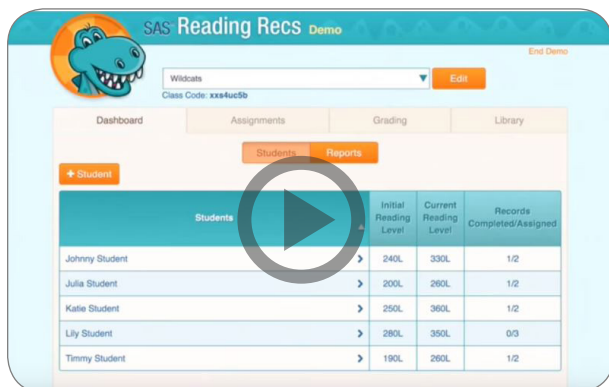
Luckily, many classrooms now have mobile devices and, thus, free access to SAS Reading Records. By complementing guidance from in-service reading specialists with research-based best-practices, this tool allows educators to gather, evaluate, and analyze data about students' reading development without cutting corners or compromising precious class time. By recording students as they read aloud, SAS Reading Records maintains the integrity of the data produced. This flexible tool also includes several features of the traditional paper-and-pencil method, further enhancing the benefits of the assessment.

Real-World Impact

Educators have been quick to appreciate these benefits. Consider the following from a teacher at Riverview Elementary School in Raleigh, NC:

I've started giving students weekly assessments through SAS Reading Records and rewarding those who score well. This motivated students to take the assessment seriously, and now they know making a good score is not as complicated as they feared. I choose the lexile, and the students choose the book. As their' reading levels grow I increase the lexile. This process gives me feedback a lot quicker than sitting in front of each child for progress monitoring. SAS Reading Records found us at the perfect time. The students were starting to mumble and grumble before we began to use this app.

For more about Reading Records, watch this iOS App Preview on YouTube.



I've chosen a single example here to make a key point: apps such as SAS Reading Records do not reduce the complexity of reading comprehension; they equip educators with information, not just data. That distinction is crucial to the goal of supporting data-driven teachers.

Not quite *if x, then y*, but a lot closer.

Now, go take a walk, and think about what I just said. Your fitness tracker will thank you.

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In-Demand Job Skills and the (Mobile) Learning Process

Lucy Kosturko, Research Scientist, SAS Curriculum Pathways

At a recent high school practice, an earnest young player asked her coach if he'd like to see her certificate from soccer camp. "I made an A," she said. The coach—with characteristic athletic-department gruffness—was unimpressed: "Let's see what you can do on the field."

Today's employers are like that coach: they're less interested in credentials and accolades than in performance. That's clear from the [survey data](#) published by the National Association of Colleges and Employers (NACE) surveying the top skills employers demand from 2015 graduates. The usual suspects made the list: leadership and teamwork skills, responsibility, problem-solving and critical-thinking skills, autonomy, a strong work ethic, computer/technology fluency, written and verbal communication skills, ambition, creativity, and the ability to plan and prioritize.

Notice the list doesn't include high GPA, AP courses or certificates from soccer camp. So where do the usual suspects for K-12 education come into play? How are the skills desired by today's employers related to common metrics of K-12 success?

Process vs. Product: Self Regulated Learning

Employers aren't concerned with the "5" a student received on her AP Economics exam (the product); they're interested in the skills that resulted in that 5. In other words, the most valuable skills students learn are acquired through the *process* of their education.

While elements like background knowledge and access to tools and resources are important to the learning process, the ability to self-regulate cognition and behavior has [proven to be a crucial factor](#)—especially for skills like problem solving and critical analysis. Why? Because to engage in complex thought one must compensate for personal limitations (e.g., the capacity of working memory or gaps in understanding). Therefore, effectively thinking at a high level and managing concurrent processes (i.e., embodying the skills in the NACE survey) demand self-awareness, motivation, and knowledge of strategies.

Such behaviors are known as *self-regulated learning*, which occurs when students know their strengths and weaknesses, set achievable goals, and are self-motivated to achieve those goals through a broad range of strategies. These students refine their skills based on past performance and respond to new situations by transferring their finely-honed strategies. It's thus no surprise that [self-regulatory skills are closely correlated with higher academic performance](#).

Good News

Self-regulatory skills are something [one can develop](#). They're not an innate skill, something one either has or (tough luck) doesn't, and the most effective time to [develop self-regulatory behaviors](#) is during the learning process. Every note they take, every paragraph they read, and every second they are in school, students have opportunities to model, encourage, and provide feedback on the skills future employers value.

But taking the time to engage in such instruction is difficult and often left out of daily lesson planning. This isn't because teachers don't want their students to have such skills—quite the opposite. A self-regulated student is a teacher's dream. So here's even better news: The ubiquity and power of mobile devices make them the perfect companion for SRL instruction.

Mobile-Based Strategies for Developing Self-Regulated Learners

I'd be lost without my smartphone. It knows when and where I need to be, it's my help-seeking tool, and it extends my working memory. The same is true for many students, whether they're using their personal device or a school-provided one, making us more equipped than ever to employ SRL instruction and modeling to help students become the lifelong learners employers seek.

SRL instruction can occur at both the local and global level. At the global level, we want to empower students to take control of their education and manage their schoolwork across classes and extracurricular activities. This involves aggregating the management of tasks into one space, modeling a variety of SRL behaviors and strategies, and allowing students the autonomy to adopt the methods they find most productive.

Guess what? There's an app for that!

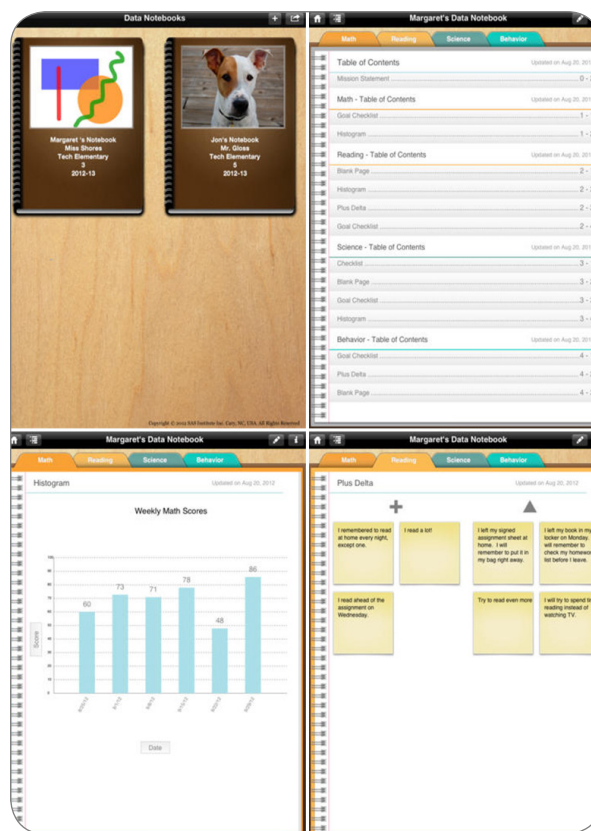
SAS Data Notebook

Designed with self-regulatory principles in mind, SAS Data Notebook provides integrated support for goal setting, progress monitoring, reflection, and communication. Students can use built-in templates to create mission statements, set goals, generate checklists, reflect using plus/deltas, create and practice spelling lists, and plot histograms of their quantified performance. SAS Data Notebook also includes a blank page and scratch paper template that enables students to load pictures and drawings. Students can also add sections to set, monitor, and reflect on individual goals by subject. The portability of an iPad allows SAS Data Notebook to be easily used both in and out of school to capture a comprehensive portfolio of the student's academic life. See SAS Data Notebook: Creating Lifelong Learners.

Writing Navigator

At the local level, our ability to self regulate can be domain or task-specific. Being metacognitively aware of the quality of one's writing can be difficult, so schools often target the—you guessed it—product instead of the process. More than simply producing a quality essay, writing instruction is concerned with helping students understand the purpose of their writing: how the main points are organized and conveyed, where revisions are needed, and when it is time to publish. We want students

to ask the questions professional writers ask themselves automatically. Allow me to introduce SAS Writing Navigator, your new tool for taking writing instruction to the next level.

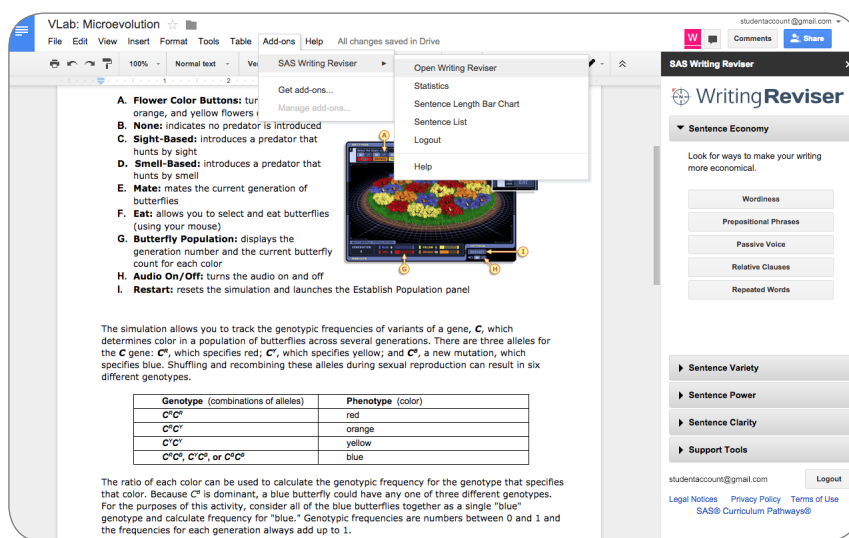


A 4-tool series, SAS Writing Navigator guides students through the writing process: planning, drafting, revising, and publishing. Writing Planner uses a graphic organizer format to get students thinking about their purpose, audience, and main ideas. From there, their work is sent to the Writing Drafter where students transform their rough ideas into an essay. Again, students are encouraged to think critically about their purpose and audience.

Student essays are then sent to Writing Reviser, the most popular resource in SAS Curriculum Pathways, and now available as a Google Docs add-on! Writing Reviser focuses students' attention on their purpose and audience, essay structure, and use of written language (sentence economy, variety, power, and clarity). Areas potentially in need of revision are highlighted and instructional prompting and tools help students make informed decisions about their work. As a result, they begin to express themselves with greater precision and power. Run your last email through the Writing Reviser—I dare you!

Finally, the Writing Publisher is the proofreading gateway. Students are forced to slow down and take one last look at their work before publishing. This feature helps students to see their text anew: they review what they've actually written rather than what they meant to write.

Dorianne Laux—director of the creative writing program at NC State University, author of five poetry books, winner of a Guggenheim Fellowship—comments on what makes this series special:



"Writing Navigator isn't just about surface details: this is right; that is wrong. No one learns to write effectively and memorably from a merely prescriptive, schoolmarm approach—a bunch of abstract Do's and Don'ts. This interactive product goes deeper than that. It prompts students to make creative decisions, to *discover* what they want to say, to reach for what Coleridge called 'the best words in the best order.'"

Verbal communication and problem-solving skills are seldom formally assessed in school but are heavily weighted in job applications and interviews. "Education," W.B. Yeats famously said, "is not the filling of a bucket, but the lighting of a fire." Using high-quality products that help students model and reflect on the learning process can provide the spark essential to that transformation.

No Cost. No Catch. How One Company Hopes to Close the Achievement Gap

Lucy Kosturko, Research Scientist, SAS Curriculum Pathways

Tucked along the northern coast of Spain lies the [Cave of Altamira](#). For those who haven't brushed up on their Upper Paleolithic history in a while, the Cave of Altamira is a big deal for historians and anthropologists. Vibrantly displayed along the walls of the 300 meter-long cave are rock paintings of bison and other mammals dating back to 14,000 B.C. Upon its discovery the rich colors and skilled depictions threw experts for a loop and completely changed our understanding of the intellectual aptitude of prehistoric humans. Visiting the cave to view the beautiful paintings would be an unforgettable experience.

But don't book your plane ticket quite yet. Unlike other World Heritage Sites like the [Giza Necropolis](#) or [Easter Island](#), access to the Cave of Altamira is highly restricted. For years, the cave was closed to visitors as part of an effort to preserve and protect the site. [Although the cave was recently reopened to select visitors](#), getting on the list is no easy task. Five lucky Altamira Museum visitors are chosen at random one day per week to go on the strict 37-minute guided tour. The rest of us have to make do with the second-hand experience of photographs and videos.

When Discovery Hurts

Just as the Cave of Altamira altered our view of what prehistoric humans could achieve, so technology has altered our perception of how students learn and what they can achieve. Consider the way technology expands the scale of high-quality content. From disseminating work to collaborating with other great minds, access is no longer confined by geography. For example, students all over the globe can now take the [How to Reason and Argue MOOC](#) from the best philosophy professors at Duke University for free, no parking sticker required. For classroom teachers, this expanded reach offers the freedom to crowdsource lesson plans by weaving together the latest and greatest from around the world instead of starting from scratch.

Classroom technologies proliferate rapidly, but economic constraints and daunting price tags often limit their impact. How promising are technologies only some students can use? Do we want education to follow an Altamira model, rewarding the lucky few while the rest of us stand grumbling outside the cave, making do with drawings and descriptions?

America's Gaps

Educational agencies talk a lot about [achievement gaps](#). At the most basic level, such gaps are defined by a statistically significant difference in test scores between two groups: male/female, rich/poor, Black/White, etc. Many very smart people analyze various gaps by, say, geographic location or demographics to determine why they exist and how they change over time. One emerging factor, technology, has shown both positive and negative effects, which begs the question: Do EdTech solutions run the risk of widening the achievement gap by widening the opportunity gap?

We believe this risk is a product of accessibility, which we define as access to resources and opportunities and the degree to which students of all abilities can take advantage of a particular resource.

Regarding the first part of that definition, the [Office of Educational Technology](#) states, “All students have the right to an equitable education. This right should not be affected by geographic location, family income, or any other demographic factor.” Again, technology can be seen as the great equalizer, bringing high-quality content to all. Developing and deploying such content takes resources, however, and often comes at a premium. In fact, [the non-hardware K-12 EdTech market was valued at \\$8.38 billion in 2015](#). Purchasing devices often depletes the school’s budget and nothing remains to buy software. The result is akin to owning a car without the gasoline to drive it.

For the second part of the definition (i.e., accessibility to all learners), let’s shift the focus to students with physical and mental disabilities. Again, technology has proven a remarkable solution ([take a look; you’ll be amazed](#)). But any educational software that is not accessible to, for example, a student with a visual impairment widens the opportunity gap and therefore widens the achievement gap. As with price, accessibility reveals that not all EdTech is created equal. Issues such as an incompatibility with screen readers or color combinations that do not adhere to best practices make certain programs obsolete to public schools, which [must ensure that disabled students have opportunities equal to those of their peers](#).

In short, if a school cannot afford software for their students or if a student cannot physically use a certain program, the promise of “the great equalizer” becomes the Altamira of the EdTech world: wonderful for some, inaccessible to many.

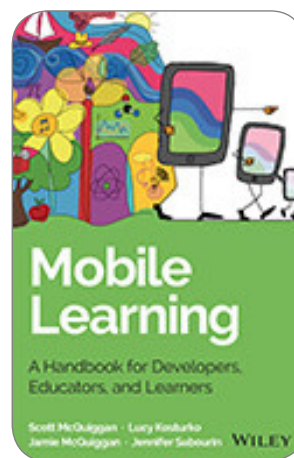
Finding the Giza Necropolis

So is there hope for the promise of EdTech? Does the Giza Necropolis or Easter Island of EdTech exist?

Absolutely!

Organizations such as the Word Wide Web Consortium and developers of Open Educational Resources (OERs) understand issues of access and outline best practices for accessible software development to ensure equal access to high-quality content by providing resources at no cost.

Like the developers of OERs, we at [SAS Curriculum Pathways](#) believe eliminating fees increases access to high-quality education and [are in a unique position to do just that](#). Through the philanthropy of [SAS in education](#), we offer our suite of 1,500+ interactive resources to teachers and students at no cost. Furthermore, we recognize the breadth of technology being deployed in schools and the need for cross-platform, device-agnostic resources. Our hope is that any student, regardless of geographic location or socio-economic status, in *any school*, regardless of technology implementation can take advantage of our resources. [We even wrote a book about it](#).



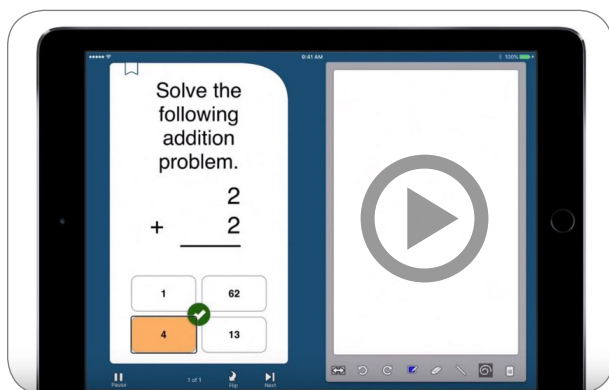
Among our suite of resources we are proud to offer [a full-length, cross-platform algebra 1 course](#). This 10-unit, 53-lesson series uses real-world problems to contextualize instruction and offers interactive practice through manipulatives, animations, videos and images. This series also provides targeted feedback for a fully proctored experience. As a result, students explore the entire breadth of a traditional algebra 1 experience and learn to solve equations and inequalities, identify sequences, graph functions, display and analyze data, simplify radical and polynomial expressions, and factor polynomial expressions.

Best of all, accessing this rich content is free to all students and flexible enough for any BYOD implementation. Indeed, we wrote the course with device diversity in mind, meaning students with a tablet, Chromebook, or laptop can take full advantage of every feature embedded in the course.



What about access to all learners? Because our resources span K-12 and are available at no cost, Curriculum Pathways is a wonderful tool for [differentiating instruction](#), [accommodating English language learners](#), and [facilitating tutoring sessions](#). Moreover, making our resources accessible to individuals with visual or hearing impairments is a concerted effort within our development process—a priority detailed [in our latest book](#). For example, [SAS Flashcards](#), an educational app released alongside the launch of the iPad in 2010, is optimized to be compatible with screen readers as seen in the video below.

Watch the video about SAS Flash Cards on YouTube.



Similarly, as part of a collaboration with the Space Telescope and Science Institute and the accessibility team at SAS we published [Reach for the Stars: Touch, Look, Listen, Learn](#), a free, multi-touch iBook for the iPad that was supported in part by a [Hubble education and public outreach grant](#). We pioneer techniques that engage visually impaired students (ever listen to a graph?) in immersive learning experiences; Sonification, 3D printing, Braille overlays, and other features supplement the rich audio and comply with accessibility standards. The response has been overwhelming and was [honored by the National Braille Press](#), which has led to [other projects in this space](#).

Watch the video about Reach for the Stars on YouTube.



So the next time you're searching for educational software, avoid the restricted Altamiras of the EdTech world. You've found your Giza Necropolis: [SAS Curriculum Pathways](#), educational resources made for all learners. No sticker shock, no catch. [We promise.](#)

P.S. Speaking of the Giza Necropolis, [here's our list of free Ancient Egypt resources!](#)

Originally posted on September 16, 2015 GettingSmart.com

Conclusion

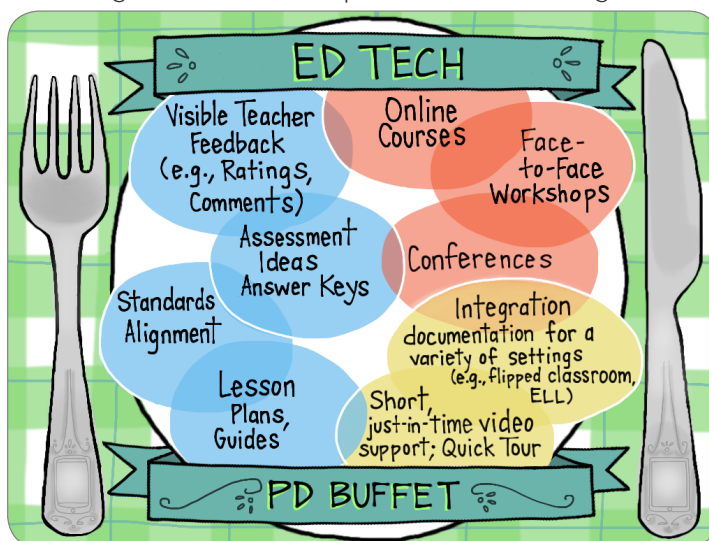
Lucy Kosturko, Research Scientist, SAS Curriculum Pathways

Professional Development: Technology’s Key to Success

Tomorrow’s classroom has arrived, and it’s an exciting place filled with authentic problem-based learning experiences and tailored to the strengths and needs of individual students. The ultimate goal? To create lifelong learners prepared to thrive in a global economy.

But the revolutionary teaching required to meet that goal demands adequate time and training. Unfortunately, because high-level conversations about transforming the classroom often focus on hardware and resources, budgetary allocations tend to follow suit—an effect that recently led some researchers to conclude that technology has had a negligible or negative impact on student performance.

A more nuanced understanding would have attributed this lack of impact to inadequate professional development (PD), rather than to the use of technology per se. Just as one would not discount modern surgical technologies based on their use by physicians trained solely in conventional methods, so one must recognize that adequate PD is a necessary condition for the success of innovative educational technologies.



Time Is Essential

Time has always been a challenge in education. To create an innovative classroom, teachers need time to create lesson plans and gather appropriate resources, time to grow, and time to learn from others in the field. Sufficient time is especially crucial for integrating technology and instilling confidence in teachers, both in a specific tool and in their own ability to use it effectively. According to a recent study, teachers believe in the power of high-quality EdTech, but many feel woefully unprepared to use it themselves. As a result, simply dropping a set of iPads in a teacher’s lap will never foster mobile learning.

To better accommodate teachers and their busy schedules, the latest trends in professional development are moving away from generally ineffective, all-day workshops and toward a “brew-your-own” PD experience. Through the wealth of knowledge disseminated online and the tools for doing so, PD is moving toward tailored, self-paced experiences coupled with strong (and often virtual) professional learning networks that provide a community for sharing best practices, resources, and other materials.

Today's teachers want professional development that is directly relevant to their classroom, provided in small, bite-sized chunks and available on their own hectic schedules.

So how can educational technology developers accommodate a large-scale, personalized approach to professional development? We've talked a lot about leveraging SAS Curriculum Pathways to clear the hurdles that separate today's classroom from the classroom of tomorrow. But mere possession of a tool does not make it useful. Untrained as a pilot, I cannot reduce my travel time to the next Alabama football game by simply replacing my car with a jet. And if I climbed into the cockpit, teachers wouldn't want their students travelling with me. Without quality PD, all the solutions [we've discussed in previous posts](#) are the educational equivalent of jets without pilots. Great potential. Brilliant engineering. Zero impact.

There are a number of ways to change that equation. At [SAS Curriculum Pathways](#), our approach has been to offer PD for our resources in various flexible formats so teachers can choose what works best for them. And thanks to the generous backing of our CEO, we [provide both the resources and the PD for free](#).

From support materials to full-fledged courses, we strive to meet the demands of our diverse user base. In addition, [our offerings](#) meet teachers right where they already are: in the classroom, at local, state, national, and international conferences, and, more frequently, online!

Professional Development Proctored by Product Experts

[Online PD Courses](#). We call these our pajama courses because they are self-paced and always accessible—even on Saturday mornings from the comfort of your own bed. Participants can even request documentation to be submitted for Continuing Education renewal credits (CEU) after completing our courses. Our [course offerings](#) include the following:

- **Exploring SAS Curriculum Pathways** provides a quick, hands-on introduction to our product.
- **Getting Started with SAS Curriculum Pathways** is an exploratory course tailored to a participant's grade level and/or discipline. The course concludes with the relevant task of creating and executing lesson plans while our PD specialists provide individualized feedback.
- **Building Unit Plans with SAS Curriculum Pathways** extends our Getting Started course, guiding participants as they build larger, long-term plans using our resources. Because live classroom integration is not required for this course, it can be taken at any point in the calendar year and is very popular in the summer. Again, our PD specialists provide individualized feedback.
- **Targeting Instructional Outcomes with SAS Curriculum Pathways** explores models of effective integration and guidance while participants are planning and implementing in real time.

The Master Teacher Collaborative

Included in our online offerings is the Master Teacher Collaborative. After completing at least two of the courses listed above, teachers are invited to participate in this training. Program participants network with like-minded educators, develop instructional plans with support and feedback, build their professional portfolios, and help develop new digital resources. Experience has shown that our Master Teachers are talented, forward-thinking educators. A partial list of our Master Teachers and those in training can be found below. By following these educators you'll receive astute guidance and practical knowledge sharing.

- [Letia Cooper](#)
- [Leigh Ann Hudson \(@LeighAnne Hudson\)](#)
- [Ben Nesselroad \(@Ben_Nesselroad\)](#)
- [Amy Morris \(@DressyPLEF\)](#)
- [Destiney Ross \(@drossncsu\)](#)
- [Gayle Mathis](#)
- [Misti McDaniel](#)
- [Julie Stern \(@jsinarski\)](#)
- [Jennifer Hammock \(@jhammock84\)](#)

Face-to Face PD and Ed Conferences

Our trained team of professional development specialists provide face-to-face PD at schools, conferences, and universities ([pre-service teachers](#)), and we partner with larger professional development organizations, including [NYIT](#), [Gear Up Tennessee](#), [Gear UP North Carolina](#), and [Batelle for Kids](#).

In order to remain engaged in the larger conversation, we also attend local, state, national, and international educational conferences. If you cannot attend these conferences, [consult our blogs](#) and [our website](#) for lessons learned and analyses of current educational technologies, as well as specifics on aligning SAS Curriculum Pathways with current best practices and instructional methods. You can often find several of us at sessions or on the demo floor at conferences such as:

- [International Society for Technology in Education \(ISTE\)](#)
- [International Association for K-12 Online Learning \(iNACOL\)](#)
- [Texas Computer Education Association \(TCEA\)](#)
- [South by Southwest Education \(SXSWedu\)](#)
- [North Carolina Technology in Education Society \(NCTIES\)](#)
- [National Council for the Social Studies \(NCSS\)](#)
- [American Council on the Teaching of Foreign Languages \(ACTFL\)](#)

On-Demand Integration Support

Quick, [on-demand](#) information is also available for PD and integration tips on the fly. Whether an educator has a minute or an hour, these [documents](#), [videos](#), [white papers](#), and [interactive tools](#) are embedded all over our website. For example, we understand that every classroom differs and every student is unique. That’s why we offer [integration strategy documents](#) outlining best practices for embedding our resources into a variety of environments for a variety of students. Such documents include the following:

- [Career and Technical Education](#)
- [Differentiating Instruction](#)
- [English Language Learners](#)
- [Flipped Classrooms](#)
- [One-Computer Classrooms](#)
- [Resources for Art and Music Education](#)
- [Spanish for Native Heritage Speakers](#)
- [Struggling Readers](#)
- [Middle School Statistics](#)
- [Mobile Learning](#)

Plan Books and Resource-Level Support

For users wondering what “a week in the life” of a teacher who uses SAS Curriculum Pathways might look like, we offer [animated plan books](#) filled with ideas on how to tailor our flexible resources to the needs of teachers.

The screenshot shows the SAS Curriculum Pathways interface for a lesson titled "Alexander the Great". The page includes the following information:

- Quick Launch #**: 1374
- Estimate to Complete**: 60-90 minutes
- Objectives**:
 - The student will
 - Activate and build knowledge about Alexander the Great’s quest for an empire that stretched across two continents
 - Analyze relevant primary-source documents, maps, and images to reinforce understanding
 - Demonstrate understanding of the strengths and weaknesses of Alexander exhibited in his quest for power
- Assessment**:
 - This tool provides two assessments of student knowledge:
 - Practice: matching activity to review key information
 - Quiz: multiple-choice assessment
 - Teachers may ask students to complete one or both of the assessment activities, which students can save, print, or e-mail.
- Teacher Materials**:
 - The following activities and answer sheets can be printed.

At the bottom, there is a table with two columns: "Practice" and "Quiz".

Practice	Quiz
Practice: Answers**	Quiz: Answers**

For each resource, we also provide integration support such as:

- *Lesson guides* to identify objectives, materials, procedures, and assessment (if applicable).
- [Each of our resources is aligned to state standards](#). Teachers can either [search our database by a specific standard](#) or view the standards associated with an individual resource.
- To help users browse our large repository, teachers are encouraged to provide a star rating and comment on their classroom experience with each resource. Students are also able to “like” resources of their choosing.

Partnerships

Finally, we’ve partnered with the most influential developers of learning management systems to ensure that students and teachers can integrate our resources as seamlessly as possible. Schools using the following systems can now access high-quality content from SAS Curriculum Pathways, many with a single sign-on. We’ve worked with many of our partners to integrate SAS Curriculum Pathways into their professional development as well:

- [Blackboard](#)
- [Clever, Inc.](#)
- [iActive Learning ProFile Planner](#)
- [Knovation](#)
- [netTrekker](#)
- [icurio](#)
- [Learning.com](#)
- [Pearson/Schoolnet](#)
- [NCDPI Home Base](#)
- [KDE CIITS](#)
- [Escambia County School](#)
- [Renaissance Learning](#)
- [SchoolCity](#)
- [WHRO’s eMediaVA](#)

We’re confident that a broad-based PD effort like the one described above can transform the potential power of high-quality EdTech into *actual* improvements in student learning. Nothing is better for student performance than a well-trained, highly-effective teacher. And we are here to help.

Originally posted on October 14, 2015 [GettingSmart.com](#)

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