

Best Practices Newsletter

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Using Technology to Support Students' Mastery of Academic Studies

For decades, classroom instruction was dominated by lectures, textbooks and note-taking. And for decades, students have often been bored and unengaged. They took notes and did what they had to do to memorize lessons just long enough to pass an exam. But short-term memorization does not help much in preparing students for college, advanced training and careers.

The omnipresence of the Internet and proliferation of technology captivates students. Even technophobic teachers realize if they are going to reach students, they must embrace technology and change how they deliver instruction.

This newsletter illustrates how technology enhances classroom instruction. It engages students, allows for immediate feedback and facilitates data-driven instruction that ultimately charts a course that prepares students for meeting college- and career-readiness standards.



Wow! I Can Do That? Harnessing the Power of Google

Millions of schools, teachers and students in grades K-12 and beyond are using Google Apps for Education. The apps offer ways for teachers to create, collect and grade assignments paperlessly and provide real-time feedback to students. Tools like Google Forms, Google Calendar, Flubaroo and Kaizena facilitate communication, collaboration and data-driven instruction. These Google tools are available at no cost to educators.

Michael Martin, an administrator at **Pioneer Career & Technology Center** in Shelby, Ohio, started teaching himself how to use the tools three years ago, and last year he started teaching Pioneer teachers. He has implemented what he calls the “PGA tour” — Pioneer Google Academy — a once-a-month professional development hour during which Martin teaches a specific Google tool.

The sessions are voluntary and take place after the school day has ended. “The fact that I get 20 teachers there for an hour after the contract day ends is a

good sign,” boasts Martin, and he added teachers come ready to create lessons. “Come in and sit, learn and apply,” Martin tells teachers. “If you can’t use it tomorrow, we shouldn’t be doing it now.”

Martin especially likes an add-on to Google called Kaizena. Kaizena is a good way to give online verbal feedback to students. A student can write a paper in Google docs (an app that allows anyone to write, edit and collaborate wherever they are); the teacher can open the document, highlight a section of text, and record comments for students to listen. For example, if there is a run-on sentence, the teacher can highlight it and explain orally what’s wrong with the sentence. The student then gets an email letting him or her know there’s a recorded comment from the teacher. The teacher can also write comments to students and supply links to websites that provide information or videos that could help students with specific content.

Martin said he likes Kaizena for a number of reasons: The teacher avoids printing out the paper, marking it up with a red pen and waiting perhaps two days or more to hand it back to students with feedback.

Martin stresses, it’s a way to provide immediate, quality feedback to students. He maintains high quality feedback has a great impact on student achievement and Google allows teachers another avenue to do this. Teachers can also use the app to read aloud exams for special-needs students. Kaizena can be accessed through the Google Web store.

Jeffrey Carpenter, a professor at **Elon University** in North Carolina, also uses Google education tools. According to Carpenter, the three most useful apps are Google Forms, Flubaroo and the Google Drive research tool. Forms, created in Google Drive, “are powerful for formative assessment,” said Carpenter. Forms are a great medium to engage students in exit ticket activities (a means to gauge what a student has learned at the end of a lesson).

Prior to becoming a college professor, Carpenter was a high school English/language arts teacher operating without the benefit of Google Forms. On a typical day he might assign a passage for students to read at home, and then require them to write answers to questions on paper and hand in the assignment the next day in class. “I started every class having no idea what students understood and what they didn’t understand. I had to use class time to find out their misunderstandings,” he said.

For any reading students do, the questions are now in the Google Forms. Students answer them online, and their answers immediately populate a spreadsheet which he can access before class. “Google Forms transforms learning because it allows teachers to get more prompt feedback and adjust their instruction accordingly,” said Carpenter.

Flubaroo helps teachers quickly grade and analyze online multiple-choice or fill-in-the-blank assignments. It computes average assignment score, average score per question, flags low-scoring questions and gives teachers the option to email each student his or her grade and an answer key. Teachers can quickly identify students in need of extra help and note questions missed by a majority of students.

Carpenter said pairing Flubaroo and Google Forms creates a great tool for self-grading and formative and summative assessment. Once students answer teacher-provided questions online and click submit, they get an automatic response with the results.

Data-Driven Instruction

“I’ve had the most meaningful data-driven teaching experiences using the spreadsheets that the Google Forms populate,” said Carpenter. “I can look through students’ responses to all of the questions. Now I can start class knowing where they’re at. I can identify how many misunderstood concept ‘A’, and I can start class talking about that concept instead of it taking me 15 minutes to figure out what they don’t understand. It allows me to intervene more quickly,” said Carpenter.

“I’ve had the most meaningful data-driven teaching experiences.”

Jeffrey Carpenter

The last questions Carpenter asks students in the Google Forms are: What questions do you have, and what do you want to learn more about? “Just that quick skim allows me to target my instruction more effectively.” Carpenter said reviewing the spreadsheets helps him adjust instruction not just for the day, but for the next semester or even the next year.

A third item Carpenter finds beneficial is the Google Research tool associated with Google docs. Among other things, it allows students to get automatic citations for research papers, images, etc. “A lot of students are inattentive in citing things. This research tool helps with proper attribution and avoiding plagiarism,” said Carpenter. It can be customized to get citations in MLA (The Modern Language Association), APA (The American Psychological Association) and CMS (The Chicago Manual of Style).

How Do Teachers Get Started

Many schools, including Pioneer Career & Technology Center, are Google Apps for Education Schools (GAFE), meaning they have filled out an application and been approved by Google to use its free apps. Learn more here: <https://support.google.com/a/answer/72223>

Oh, the Places You Can Go With Edmodo

Christina Nguyen, an English/language arts teacher at **Lee Junior High School** in Monroe, Louisiana, is big on technology and has always used it in her classrooms. When Nguyen was introduced to the Literacy Design Collaborative (LDC) instructional framework in 2013, she wondered if she would need to change her teaching style.

LDC provides tools for developing reading, writing and thinking skills. LDC’s basic building block is the module: two to four weeks of instruction comprising a teaching task, standards, mini-tasks and other instructional elements. **Lesson planning is front-loaded, meaning teachers plan weeks of lessons at a time, keeping in mind the end goal of what they want students to know and be able to do.**

Not only did Nguyen not find a need to significantly change how she approached teaching and learning with LDC, but she also found technology she had become comfortable with that enhanced her teaching approach. It also made learning even more meaningful for her students.

One teaching tool Nguyen uses is Edmodo — a social learning platform website for teachers and students. It’s marketed as the “Facebook for schools.” Teachers give students a class sign-up code to join Edmodo. That opens the door for using the online app for classroom discussions in a format that keeps

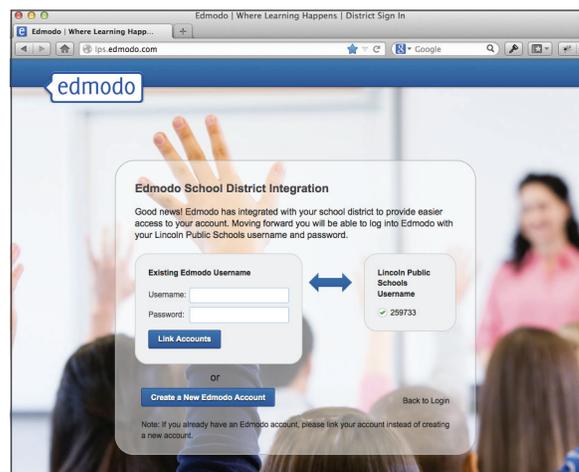
But Carpenter maintains it’s not necessary to be in a GAFE school district to take advantage of these tools. Schools with a Gmail account can automatically establish a Google drive account. Learn more at <https://www.google.com/intl/en/drive/>. Google accounts (including Gmail) can be created at <https://accounts.google.com/signup>.

To participate, schools will need to have access to computers and the Internet.

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the teacher firmly in control. Teachers may post assignments in Edmodo. Students complete the assignments, ask questions and receive teachers’ feedback, but Edmodo does not allow students to pass private messages to other students in class.



In a typical writing assignment, LDC requires peer editing. Nguyen said Edmodo not only engages students in the work, but it reduces classroom chaos. “I have 26 students in one of my classes. If I have them moving across the room to peer edit each other, it can get crazy and loud,” said Nguyen. Instead of moving about, students post their essays (written in Microsoft Word) on Edmodo; their partners download it, and since

Nguyen taught students how to digitally markup text in the Word document, they revise the essays using the computer and post it back for their partners to pick up. Nobody ever has to change seats. “It’s preparing them for high school and college,” maintained, Nguyen.

Feedback: Anytime, Anywhere

Edmodo allows teachers to respond to students’ questions anytime, anywhere. Nguyen shared how she unexpectedly had to leave school to take care of her sick child. But because the classwork was already posted on Edmodo, students accessed it, and they were able to ask her questions while she was at home and they were in class with a substitute teacher.

Nguyen also has a classroom Kindle account and downloads books, short stories, handouts and other assignments for students. “If students get home and realize they’ve forgotten their handouts, they can use their smartphone or home computer to access anything I’ve handed out,” said Nguyen. Access is no problem she said, because more than 95 percent of her students have smartphones and nearly all have a home computer.

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Christina Nguyen

Fresh Out of Excuses

With Edmodo and Kindle, students are fresh out of excuses when it comes to making up stories for not doing work. “Nobody has an excuse now, because they have access to it,” stressed Nguyen.

Scores Soar

Nguyen has been using technology for the last four years, and she said each year students have made progress on the state’s accountability reading and writing assessments. Some of her students even scored 100 percent on the writing assessment. **“I’ve never had kids make perfect scores,” she said. Nguyen credits students’ use of technology and LDC.**

“With LDC I’m more prepared by doing front-end preparations, but I’m able to execute that planning and give students the feedback they need because of the technology.”

Marrying LDC and Technology

LDC requires active reading, essential vocabulary and bridging activities. It also requires students to express their understanding of complex texts in writing. Nguyen uses Edmodo to enhance LDC lessons by:

- 1) Building background knowledge for key topics within readings and using Edmodo as the platform for posting each section students read;
- 2) Uploading PowerPoints or other resources that were shared during whole-group classroom discussions;
- 3) Assigning relevant vocabulary assignments in a virtual place within Edmodo for her students to continually access vocabulary words they need to learn;
- 4) Providing a common platform for students to share and brainstorm using the words in context;
- 5) Aligning feedback from peers and the teacher almost instantly;
- 6) Assigning discussion questions related to the LDC module being studied with real-time postings from the teacher and replies from students to the teacher;
- 7) Allowing for a virtual place for timely assignments to be created and then reviewed by the teacher to determine student understanding;
- 8) Reducing the amount of paper students must keep up with and providing the teacher with digital student work portfolios;
- 9) Summarizing and then providing students with an opportunity to compare his or her work with their peers; and
- 10) Receiving constructive feedback from teachers and peers without the pressure of having to read aloud.

Learn more about Edmodo and other free technology resources for teachers at <https://support.edmodo.com>. The help center will assist in setting up teacher accounts and profiles, and explain how students and classes can sign up.

Technology Sharpens Literacy Skills

Shiloh High School teacher **Terra Smith** found some tech-savvy ways to awaken students' curiosities and increase their participation and engagement in her British literature class. Smith prepared an assignment for seniors at the Gwinnett County, Georgia, school that focused on satire. It involved teaching students the definitions and the techniques of satire, through reading *A Modest Proposal*, a classic satirical work by Jonathan Swift.



Terra Smith, Shiloh High School

Setting the Foundation for Learning

Before putting technology into play, Smith first set the foundation for learning. She used strategies outlined in the Literacy Design Collaborative (LDC), a system for developing students' literacy skills and preparing them for college and careers. She reorganized her lessons into the LDC format. She did front-end planning (planned weeks of lessons at a time) and started with the end in mind (what you want students to know and be able to do).

"I used the 'gist' method which I learned from my SREB trainer, and that immediately opened my eyes," said Smith. For every paragraph students read, they would write a one-sentence summary in the margins. Smith said she gave students a content quiz to make sure they understood the text.

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When she taught this unit in previous years, Smith said her students' grades were typically disappointing — about half would fail. But this time, "My quiz grades jumped to the 80s and 90s. I did not change the quiz, I just changed how they read the text by writing the gist out to the side," said Smith.

Another class assignment involved researching a problem and proposing both a logical and illogical solution. Yet another one involved working in groups to present a news feature or broadcast that centered on satire.

Free Technology for Teachers

Smith then used free learning technology tools with assignments to engage students and add relevance. Some of the technology included:

- Padlet — An electronic screen allowed students to use a code to type in a question. A sticky note would pop up on the screen. Smith said this helped to engage students who were nervous or didn't want to be embarrassed by asking questions.
- Penzu — Using this online journal, students, as a group, would share the same user name and password and share comments about what they thought a paragraph (or other text) was about.
- Voki — Students could customize and make an electronic avatar and give it a voice by typing what they wanted the character to say. Smith said allowing students to type answers to questions and having the creatures verbalize the answers encouraged more class participation.
- Quizlet — Smith downloaded all of her quizzes to Quizlet to deliver content to students electronically. Students could take the quiz in class or at home.

Smith was blown away by students' final papers. "Their papers showed me they had done the research, that they understood the logical solution and that they understood the aspects of satire. Their presentation showed me they could master it," said Smith.

To get a non-bias assessment of her students' progress, Smith used a program called Write ToLearn, an online literacy tool that accurately assesses writing. Teachers set the parameters of what they want to assess — grammar, sentence structure, tone, etc. Smith said at the end of the first semester, before LDC was in full use, her class average on the essay was in the 3s (not good; 6 would be exemplary). The Write ToLearn software provided feedback on what students needed to work on to improve, and it allowed them six opportunities to rewrite. To her dismay, after six chances, Smith's class average was still in the 3s.

However, that changed after a semester using the LDC framework. Smith had her students write their final satirical essay in the Write ToLearn program; the class average score jumped to the 5s, one point lower than exemplary. Additionally, students did not need to do six revisions to reach that score. To make sure everything was on the up-and-up, Smith randomly pulled 60 of the 137 essays and downloaded them into the software to check for plagiarism. **She was pleasantly surprised; there was none. Smith's class averages have increased from 60 to 70 percent to 80 to 87 percent.**

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Integrating Technology Into the Math Classroom

Many students have a dislike/hate relationship with mathematics. For some it's often the most dreaded subject in school. But more and more teachers are getting students hooked on math with technology. The right tools can engage students and advance their understanding of math concepts and their mastery of state and national standards.



RuthieAnn Trujillo teaches Algebra I to ninth-graders at **Highland High School** (HHS) in Albuquerque, New Mexico. She said most of her students performed in the bottom 25 percentile in math on their eighth-grade state accountability exam. Some of these students have never had success in math. **Now that's beginning to change in part due to two school improvement initiatives — incorporating the TI-Nspire™ Graphing Calculator with the Navigator System into the classroom and the Mathematics Design Collaborative instructional strategies.**

Using the TI-Nspire™ Calculator

The TI-Nspire™ calculator and navigator system were developed by Texas Instruments. It features touchpad navigation with a full keyboard for simple operations. The navigation system enables educators to quickly connect to all of their students to perform real-time assessments, share files and monitor student understanding of concepts.

Trujillo said the navigation system has a wireless device that connects to her laptop. Within the software she can create her own classroom lists with each student's name and login information, and she is able to monitor students' work. Thanks to a school improvement grant, every math teacher in the high school has been provided enough calculators so that each student has access.

Mathematics Design Collaborative

The Mathematics Design Collaborative (MDC) provides schools with instructional tools needed to help teachers understand and implement the college- and career-readiness math standards effectively while allowing them the flexibility to select topics and adapt assignments to their specific instructional plans. Coaches and trainers at the Southern Regional Education Board (SREB) provide staff development to help teachers learn to teach the MDC framework.

Central to MDC are sets of formative assessment lessons (FALs), which are aligned to the college- and career-readiness standards and designed to be

embedded within courses. The FALs focus on student understanding of math concepts, allowing students to experience “productive struggle” and make sense of math concepts. FALs assists teachers in determining what changes in content and instructional strategies are needed to enable students to master rigorous standards.

Trujillo wanted to find ways to seamlessly incorporate these two initiatives into her lessons. “I didn’t want to say today we’re going to do calculators and tomorrow we’ll do MDC. I wanted to find a way to merge the two and help my students succeed.” said Trujillo.

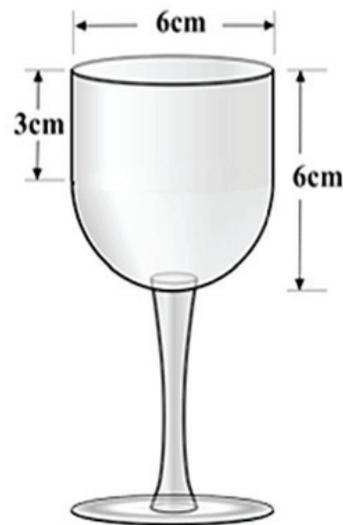
She said implementing MDC was challenging, introducing a level of rigor students had not experienced. “I started using the technology to engage them and support them in completing the lessons.”

When Technology and Math Merge

“Technology is easy for kids to figure out. It gives them confidence to attempt the rigorous math. It’s a tool that makes the content seem less challenging. I think that in itself is going to help,” Trujillo said.

The TI-Nspire™ calculators are easy to manipulate. It allows students to focus on the lesson objective instead of highlighting operations they don’t know or other weaknesses they may have, Trujillo indicated. For example during one lesson Trujillo created a glass-like container using the calculator. Students were given the dimensions of the glass and asked specific questions such as: “What’s the volume of the glass?” Students used arrows on the calculators to change the height of the glass, and they could see as the height changed, the volume changed. “It’s the discovery we want kids to do, but without the tedious plug this number in and get out this. They could see immediate feedback,” Trujillo said.

A more challenging question for the students was: “If the cup is half full, what would the height be?” Trujillo said most students automatically said the height would be cut in half. Then she gave them a prompt that read, “Here is some work by another student, explain what the person did wrong.” Students realized that student wrongly concluded the height of the glass would be cut in half, and they soon caught on that cutting the volume in half doesn’t mean the height would be cut in half.



Trujillo used this time to shift the focus to classroom discussion and productive struggle, a strategy advocated by MDC. Students were asked to team up with other students, explain their answers and convince classmates they were right. “Kids started to really talk to each other about math,” she said.

MDC uses FALs that require 20 minute discussion sessions. Trujillo divulged she worked with a student population that was not used to talking about math. “They struggled with their academic and math vocabulary,” she added. Before using the calculator, Trujillo said she had difficulty engaging the class in the discussion part of the FALs; now she exceeds the 20 minute discussion time.

The calculator also allows teachers to collect instant data. For example, the Algebra I cohort at HHS gives common quizzes every two weeks based on bell-ringer activities. A bell ringer is a short activity that can be completed while teachers take attendance, collect homework or other small chores. The teacher may place a review question related to instruction on the board. The idea is to continuously engage students from bell to bell.

In HHS math classes, Trujillo said the bell-ringer activities are short prompts that students can begin working on immediately and accomplish on their own during the first 10 minutes of class. It’s tied to five fundamental topics that students have not mastered. All algebra teachers got together over the summer and decided what the first five topics would be.

Every two weeks they administer a common assessment, and if the students, as a cohort, demonstrate proficiency (80 percent or above) then a new topic would replace the proficient topic. If not, the students would repeat the topic the following week.

Student Achievement Increases

Since the school began implementing the calculators and MDC strategies three years ago, Trujillo said students are progressing through far more topics in their bell-ringer activities. After the first year, students made it through 20 topics; the next year 23 topics, and just mid-way through the third year, they progressed through 27 topics.

Algebra I/strategies students who used technology were also achieving higher scores than honors students when tested on strategies such as addition of integers, order of operations, functions notations, combining like terms and solving one-step equations.

Trujillo also said sophomores who used the calculators for one full school year progressed from 17 percent Proficiency on New Mexico's Standards Based Assessment (SBA) in 2012 to 35 percent in 2013 — more than a 50 percent increase. The highest performing school in the district only had a 25 percent increase, she noted. The SBA consists mostly of Algebra I and geometry. In addition to that, the school's graduation rate climbed 10 percent in one year — from 54 percent in the 2012 to 64 percent in 2013.

The TI-Nspire™ graphing calculators are also permitted on the numerical skills portion of the SAT, ACT and other standardized exams.

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This newsletter describes best practices in implementing the High Schools that Work (HSTW), Making Middle Grades Work (MMGW) and Technology Centers That Work (TCTW) school improvement models based on presentations at the 28th Annual HSTW Staff Development Conference in Nashville, Tennessee in summer 2014. For more information about the school improvement models offered by SREB, contact: Gene Bottoms, senior vice president, at gene.bottoms@sreb.org or call (404) 875-9211.