



Classroom data collection demonstrates the power of data to personalize learning and it's often overlooked.

by Kerry Gallagher

What Data Can Do: A Teacher's View of Digital Tools for Formative Assessment

My students stroll into my class from the hallway. Some are giggling with friends, some arrive alone with their eyes down, and a one or two always seem to make a grand entrance. No matter how they enter, they all know to sit in their small groups and pull out their phones, tablets, or Chromebooks in our bring-your-own-device (BYOD) classroom. Then they look up at the screen in the front of the room, where a QR code and a shortened URL are posted. A few get up to scan the QR code; the others type the URL into their browsers.

Then they get busy. Today they are playing a game that tests their retention of the content from video clips and primary source readings we analyzed in yesterday's class. Most are looking at their own screens, but some are peeking at their neighbor's and are pointing or whispering.

Besides greeting individual students as they entered, I haven't said anything yet.

But I already know exactly what they know. Their answers, right or wrong, are color-coded and appearing in real time on my iPad. I glance at their answers while walking around making small talk with individual kids.

I'm collecting instant formative data. Some of it was collected electronically using the game app I set up for them to play as they entered. Some of it was collected when I observed their body language and facial expressions as they entered the room or in our small talk.

By the time class really gets rolling, I know exactly where my students have misunderstandings and what content they have mastered. I know which students are ready to learn and which have something else on their minds.

What Is Meant by Student Data?

As class starts in schools each day and all over the country, teachers like me are

relying on data they collect to learn about their students and personalizing learning based on those data. These “daily data” collections are often not considered within the context of policy discussions on student data privacy. When policymakers, parents, and researchers talk about student data, they mostly refer to four general categories:

health/ability

medical information, allergies, physical and intellectual disabilities, individual education programs, accommodations

behavioral

disciplinary records, behavioral intervention plans, notes on behavior

academic

grades, test scores, progress reports

directory

name, age, address

These categories are not meant to be exhaustive, but they help identify types of data schools collect. Some data are quite specific and sensitive; some are relatively well known even outside of school. At many student privacy conferences and symposia I’ve attended or in which I’ve participated on panels, however, the instant formative data that classroom teachers rely on daily is not referenced much.

What Are Formative Data?

Formative assessments are in-class exercises that let teachers and students see where they are and what they need to review. Here are a few key elements:

- Formative data are gathered during the learning process; they are used to track progress while students are learning skills and mastering content.
- Low stakes attach to them; they don’t count toward a grade or only as a very small percentage.
- Immediate feedback is possible; teachers can share the results of the assessment with the student right away.
- Teacher and students modify their approach to the content based on the resulting data.

The low stakes and immediacy of formative assessments are what make them about monitoring, and not testing, student learning.¹ This process of learning, assessing, discussing, planning, and learning again is a continuous, real-time feedback loop. It leads to deeper understanding of content and mastery of skills.

Digital tools are making it easier than ever for teachers to gather and analyze formative data. Paper exit slips can take a classroom teacher upward of an hour to sort and graph after just one day of classes. But now, that same teacher can pose a question out loud to the class and ask students to type answers on their mobile phones and hit send. Instantly, the educator knows which students understand and which do not. They can then apply last-minute lesson plans or homework assignment interventions on the fly.

Teachers and Students Assess Benefits

Elizabeth Solomon, a high school Latin teacher in Massachusetts, includes quick formative activities in the slides she uses to structure her lessons. “I embed questions within existing presentations so that students remain engaged and participatory throughout a class which was, traditionally, much more passive for them,” she says. The bonus for her is that she can see her students’ answers immediately on her laptop. They are engaged and she can instantly identify what they have not understood.

Even Elizabeth’s students agree that submitting their answers and learning how their classmates are thinking helps them stay on track. A junior says, “It’s a great way to have more interactive learning.” His classmates adds, “It feels more like a game. It’s like the teacher and the students are all working together even though we are all on our own devices.”

Student engagement is a substantial benefit, but Elizabeth also knows she is meeting students’ learning needs faster than ever before. “Because the questions are distributed throughout a presentation, I can recognize immediately when the class understands something and is ready to move on to the next step in the lesson. And if they don’t understand, I don’t overwhelm them with additional information that they are not ready for.”

Another Latin student says he better understands how he and his classmates are doing.

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He notes, “When I enter answers, even if I’m not 100 percent right, at the end I get to see everyone’s answers anonymously and check the trends. It helps to see that I’m not the only one making a mistake and to see how everyone is doing.”

Students and teacher are sharing and learning from one another’s learning data during their 50 minutes together. As a result of this sharing, they have built a stronger classroom community.

More Frequent Checking of Student Progress

Nicole Prince, a middle school science teacher in Massachusetts, likes to make formative assessment more game-like with an app that uses colors, shapes, and music to get her middle school science students out of their seats. “These apps can engage and excite the entire class, and they allow me to identify and address misconceptions immediately.”

In her middle school life science class, the seats are empty. Students are up and moving. They are using their iPads to respond to questions about cell organelles set to music and video on the big screen. As their results are displayed, they cheer!

Each time her students’ excitement builds, Nicole reels them in by asking why a certain cell organelle fills a particular need. Hands are up all over the room.

In classrooms across the country, digital tools are making this kind of exciting learning environment possible more often, and teachers need less preparation time. Nicole can give her students feedback more often. “Using technology has increased the number of formative assessments that I can give without requiring me to correct more papers.” The digital tools aggregate, sort, and color code the data. Visually, Nicole knows instantly which parts of the content need more study and which parts her students have already mastered.

Passionate About Math in Middle School

From our first conversation, I wanted Glenn Blakney to be my child’s math teacher. He is passionate about making his middle school students experience math rather than merely learn about it.

His latest approach uses open educational resources with digital formative assessment. He

explains: “I can use a picture or a screenshot, I can use a clip from YouTube, and I can add my own material and modify it for the lesson. So I can differentiate for the level of the class.” For example, Glenn’s students learn about algebra by watching and calculating speed and distance from skateboarding videos.

When Glenn mixes open source multimedia content with digital formative math problems, his students get a chance to practice what they are learning and find out how they are doing right away. “My students can open it right up in the classroom; we can project their work on the board for discussion. I can modify the questions on the fly or probe their thinking in real time to correct misconceptions.”

Glenn has realized long-term benefits to tracking student learning data with formative assessment tools. He explains, “This information can be displayed anonymously for class discussion, and it can be stored, tracked, and analyzed over time. I can feed it right back into my unit and lesson planning, adjusting my class in real time to meet my students’ needs.” Glenn is able to share this data with his students and their parents as needed so that all stakeholders are informed.

Removing Anxiety

Derek Larson, a fifth grade teacher in Utah, also knows where his class stands. “They’re just playing a game,” he says. “My students are too busy playing that they forget they are showing me in real time what ideas and concepts they need more help with.”

His fourth graders respond differently to the word “test” than they do to other terms. When he uses formative assessments, he lets students call them whatever they like. Whether Derek uses technology or not for formative assessment, his students typically call it a game. “I tend to downplay the word test because I don’t like to see their anxiety,” he says. “But these simple and fun formative assessments help my young students stay more engaged and active while I’m able to get the information I need.”

Formative assessments need not be digital.² Teachers have been using formative data for a long time, but even one device can make a difference when teachers want to look at and use the data more efficiently. At the elementary

level, Derek's students do not have BYOD or one-to-one devices, so he uses paper cards that his students hold up to show what they have learned. He uses his own tablet to scan their cards and collect data. He is able to export their answers to a spreadsheet and use it more for detailed planning as well as on-the-spot interventions. "My students respond better to these amazing types of formative assessment because it's less risk and less worry," he says.

Implications for State Boards of Education

It is essential to remember these lightbulb moments when discussing the risks and rewards of classroom data. Without the digital formative assessment tools and data that Elizabeth, Nicole, Glenn, Derek, and I have, we would not be able to personalize learning for our students. It would be impossible to track their progress so quickly or easily. Since formative data are usually not used for grading, they are shared only between teacher, student, and parents. The teachers who rely on these data can give their students immediate feedback and support, and they would not be able to do their jobs as well without it.

Educators are invested in what is best for their students both inside and outside of their classrooms. But while teachers do engage in professional development on how to collect and interpret formative data to benefit student learning, they typically do not get similar opportunities to learn how that data can be used by others who have access to it. By providing district and school leaders with the time and resources to inform teachers about the power of educational data both in and outside the classroom, state policymakers can help teachers protect students better.

When education agencies and advocates think of student data, they often think of the information that is reported to state agencies: census information, student health records, and academic achievement. Policies that secure those data cannot be so restrictive that classroom teachers are prohibited from tracking daily data from formative assessments and communicating that information to their students. For instance, when the vetting process for a digital tool is too cumbersome or lengthy, teachers cannot get access to the tools they need

in time and lose the opportunity to collect, analyze, and adjust instruction quickly based on formative data. Classroom data help teachers know their students better, help students track their own progress, and the resulting communications help provide parents with a better understanding of what their children are doing in school every day. ■

¹Whys & Hows of Assessment: What Is the Difference between Formative and Summative Assessment?" (Pittsburgh: Carnegie Mellon University, Eberly Center 2016), <https://www.cmu.edu/teaching/assessment/basics/formative-summative.html>, accessed January 31, 2016.

²West Virginia Department of Education, "Teach21, Examples of Formative Assessment," (Charleston, WV), <https://wvde.state.wv.us/teach21/ExamplesofFormativeAssessment.html>, accessed January 31, 2016.

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Kerry Gallagher is a digital learning specialist at St. John's Prep in Danvers, Massachusetts, and director of K-12 education for ConnectSafely. Kerry taught middle and high school history in bring-your-own-device public schools for 13 years, and her classes were paperless. Find Kerry at @KerryHawk02 and www.KerryHawk02.com.