Assessment for Instruction and Learning

In the last decade, there has been a growing movement toward integrating assessment in instruction and learning. Research (Black & William, 1998; Vygotsky, 1978; and Heritage, 2010) has shown that embedding assessment opportunities for teachers and students provides insights into student progress in the moments of learning, maximizes learning, and moves learning forward.

Karen Barton, Discovery Education's Vice President of Learning Analytics, offers suggestions for integrating assessments into mathematics instruction and learning.

1. **Embed assessment**
   Teachers are constantly embedding assessment opportunities every day in their classrooms even when they may not realize it. They observe students in many different environments - playing games, working with their friends, completing assignments, and learning through digital resources. Teachers can learn how their students learn, how they think, how they participate in groups. These informal assessment opportunities provide nuggets of information that can be powerful in helping teachers make decisions about how to individualize, differentiate, and personalize instruction and organize mathematics and other classes.

2. **Blend Informal and Formal Assessments**
   Both informal and formal assessments can provide key insights throughout learning. Teachers, as well as students, can observe and evaluate understanding during the learning process informally, such as through discussion, peer reviews and self-reflections, to ensure learning and instruction are on target. More formal assessments towards the end of the learning cycle can provide confirmation of what students have learned or what mathematics concepts and skills require remediation and even enrichment. Together, formal and informal assessments can provide educators a clearer, richer picture of a student's progress toward their learning goals.

3. **Using Instructionally Useful Technology**
   With the coming of the new PARCC and Smarter Balanced assessments, there's been a lot of talk about TEIs (Technology Enhanced Items). What and why are we enhancing, exactly? These items have a place in the summative assessments, but they can also be beneficial when embedded within instruction and learning. TEI's can enhance how skills are measured, enhancing the validity and authenticity of the skills being targeted. TEI's also allow us to capture digitally what students did well and, just as importantly, not well. With that information, the teacher can decide what's next for instruction: *do I need to go back to remediate or go forward because students are ready to move on?* When TEIs are embedded instruction, they also offer scaffolding and feedback to students in real time, in learning moments – something teachers cannot do for every student in every assignment or activity, every time. Timely and informative feedback can be powerful in the success of learning.

4. **Use the Right Tools for the Task**
   Selecting the right tools to solve a problem is an indicator of more advanced understanding. Experts know how to use the right tools for the right problem in a strategic way. Use and mastery of digital, interactive tools such as graphing calculators and geometry software in assessment is good practice. Knowing what the tools are, when a tool is needed and how to choose the right tool is critical to preparing our students for college and beyond. Teachers can observe and assess if students are using the tools in the right way – or even an interesting way – to solve a real-world problem, and technology can help capture the data for teachers.

5. **Take Play Seriously**
   Students can learn in all kinds of situations, including play. When play is situated purposefully in learning, students can learn applications more quickly and can transfer the skills more readily. They can more freely make mistakes, try again, and persevere to find solutions. There is value in each.

6. **Put Students in the Driver's Seat**
   Research has shown that when students self-assess, reflect, and engage in progress monitoring, they become more engaged in and responsible for their own learning and do better. Students of all ages should be involved in the goal-setting process and in seeing how they are doing against those goals. The visualization of this information is critical: they must be able to clearly see progress for themselves to become engaged in their own success. They learn from their mistakes and benefit from seeing where they are headed.

7. **Let the Data tell the Story**
   Just as students can benefit from seeing their progress, teachers need ways to track student progress for each student. With the demands of teaching and with many teachers having multiple classes and large class sizes, teachers need tools to quickly see where they are in their understanding, and to answer questions such as: *How is my class doing overall? Where is each of my students on the spectrum of the goals I have for them? Do I see a pattern of misconceptions and mistakes? What students need small group or peer-collaborations? What motivates them and engages them in their own learning? What do they need next?* The most effective instructional decisions are driven from answers to these questions. Research shows that teachers don't have always have the time, tools, and training to answer these questions completely.

8. **Support Teachers with Professional Development**
   Teachers need the skills and tools to employ successful informal and formal assessment techniques in their classroom. In addition, teachers need the skills and the autonomy to create assessment opportunities throughout learning, particularly with informal assessment, to really understand how to get to the bottom of what students know and don't know in the moments of learning where it is most critical. Teachers also need to be comfortable with a balance of instructional approaches, including inquiry-

based models. Just as we teach students, teaching teachers to develop the skills to ask questions effectively, gather data and take action will help them prepare students in a way that they will be ready for deeper learning, as well as various high-stakes assessments.

Administrators play a huge role in creating a culture that values informal assessment, a shift in paradigm for many schools. Many teachers may fall back on a quiz or drills, when there is rich, instructionally useful information that can be made simply through observation and engaging activities.

More closely integrating assessments into mathematics instruction and learning is one of one of the ways educators nationwide are working to improve mathematics achievement.

About the author

Karen Barton is the Vice President of Learning Analytics for Discovery Education. She has more than 20 years of experience in education, psychometrics, and research in areas such as validity, accommodations, special populations, scaling and equating, learning progressions, item development, and technology enhanced assessments. Previously, Dr. Barton served as Discovery Education¹s assessment and learning analytics expert in her role as Senior Director, Psychometric Scientist, where she lead the company¹s efforts to integrate the effective use of data towards instructional impacts, the development of instructionally relevant assessment resources and interactive learning environments, alignment, and standard setting, in addition to establishing protocols for the evidence-based development and data collection of Discovery Education¹s technology enhanced items across assessments and Techbook series. She received her B.S. in psychology and M.S. in Special Education from Longwood University in Virginia, and Ph.D. in Educational Research in Measurement from the University of South Carolina.