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### Ongoing, Continual Assessment of Teaching and Learning

In this article in *Teaching Children Mathematics*, Francis (Skip) Fennell and Barbara Ann Swartz (McDaniel College), Beth McCord Kobett (Stevenson University), and Jonathan Wray (Howard County Schools, MD) say there's a disconnect among planning, teaching and assessment- and thus, between teaching and learning. **Assessment must be linked to the planning and instruction of a lesson- every day- ensuring that lesson activities inform teaching and learning for all students.** The key is *eliciting* and *using* evidence of student thinking to improve teaching and learning in real time. The authors believe that judicious use of a "palette" of on-the-spot checks for understanding can make all the difference:

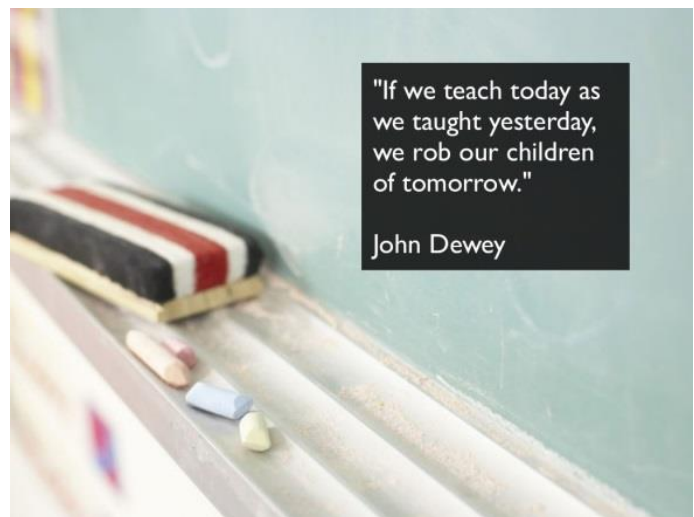
- **Observations**
- **Interviews**
- **Show-me activities**
- **Hinge questions**
- **Exit tasks or lesson closers**

The first three can inform instruction during the lesson and the last two are helpful planning for the next day. Here's more detail on three:

- **Show-me activities** – Asking students to demonstrate what they are learning provides teachers with a glimpse of students' grasp of particular concepts and skills – for example,

### Important Dates:

- **April Vacation 18-26**



"If we teach today as we taught yesterday, we rob our children of tomorrow."

John Dewey

## Ongoing, Continual Assessment of Teaching and Learning Continued

- “Use base-ten blocks to represent 57 in three different ways” (1.NBT.A.1)
  - “Using your pattern blocks, show me two different ways to represent  $\frac{1}{3}$ ” (3.NF.A.3b)
  - “Use a drawing to show me  $32 \div 4$ ” (3.OA.B.6)
- **Hinge questions** – These “deal-breaker” questions, planned in advance, are designed to strategically check for understanding at a natural break or hinge-point in the lesson, telling the teacher what students understand so far and what needs more work, usually the next day. Daily use of a hinge question also implies a thorough understanding of the intent of the lesson and its mathematical and pedagogical focus. An example of a hinge question- Primary (1.G.A.2): “What are ways in which squares and rectangles are similar and different?” (2.NBT.B.9) “Is  $45 + 59 >$  or  $< 100$ ? How do you know?” Intermediate (4.NF.A.2): “What is the order of  $\frac{4}{5}$ ,  $\frac{4}{6}$ , and  $\frac{4}{8}$  from least to greatest?” (5.MD.A.1) “500 mL of water was needed for the recipe. If that amount were tripled, how many liters (L) would be needed? How do you know?”

• **Lesson closers** – In a companion article, Robyn Silbey suggests carefully planned closure questions to see if students have reached the lesson’s learning goal – for example, after a lesson on whole-number quotients (4.NF.6), here are some possible questions for partner talks or group talk, a demonstration, or whiteboard responses:

- **How are division and place value connected?**
- **What are some ways you can check to see if you divided correctly? Why do your checking methods make sense?**

- You divide 402 by 3 and by 6. Without actually dividing, predict which quotient will be greatest. Explain your thinking.
- What pictures would you draw to show  $121 \div 5$ ?

“The value of lesson closers is the immediate feedback provided to students and teachers alike,” says Silbey. “Summarizing knowledge by articulating it verbally reinforces pride in learning as it celebrates accomplishment.” Teachers are advised to design lesson closers that relate to the lesson’s goal and assess conceptual understanding rather than having students perform computation.

“Classroom-Based Formative Assessments – Guiding Teaching and Learning” by Francis (Skip) Fennell, Barbara Ann Swartz, Beth McCord Kobett, and Jonathan Wray, and “Did Students ‘Get’ It? Teachers Can Find Out Now!” by Robyn Silbey in *Teaching Children Mathematics*, February 2015 (Vol. 21, #6, p. 325-327), [www.nctm.org](http://www.nctm.org); Swartz can be reached at [bswartz@mcdaniel.edu](mailto:bswartz@mcdaniel.edu), Silbey at [robyn@robynsilbey.com](mailto:robyn@robynsilbey.com).



## A Math Problem That Will Get Third Graders Thinking

In this *Teaching Children Mathematics* article, Ed Enns (Waterloo Region School District, Canada) suggests the following problem-solving challenge and invites teachers to try it with third or fourth graders and e-mail him with solutions, student work, and feedback.

Students work in pairs or triads supplied with a large piece of paper to record solutions, pens or markers, and (optionally) calculators. Here's the problem (given to students after some introductory discussion of allowances):

- *You are going to receive an allowance for the next twelve weeks. You must choose how you would like to be paid. These are your choices:*

- *You get \$2 for the first week, but you get \$0.25 more every week after that.*
- *You get \$0.01 for the first week, but the amount doubles every week after that.*

*How much would you get paid if you picked the first approach?*

*How much would you get paid if you picked the second?*

*Which choice would give you more money?*

After reviewing the problem with the class, Enns suggests having students make a prediction of which choice bring in more money and take a straw poll to see what students think. As groups work on the problem, the teacher circulates to observe problem-solving strategies and perhaps take digital photos of their work. "Try not to tell students how to do the math," he says, "but use questions to provoke their thinking," such as:

- *What is the rule for how much money you will receive?*
- *How much money do you get the first week?*
- *How could you keep track of how much money you receive each week?*
- *Is that amount in cents or dollars?*

*- How much money would you have altogether after 12 weeks?*

Students who finish early might be challenged to try a third payment option: *Flip a coin each week to determine the amount of allowance – if the coin lands on heads, you get \$6, if it lands on tails, you get no allowance. Could this end up being more lucrative than the other two approaches?*

When students have finished, have groups present their solutions and strategies and compare and contrast them in terms of accuracy and efficiency.



This scenario affords students a context to compare two different growing patterns: one is additive and the other is multiplicative. It also promotes the use of a table as an organizing framework for recording and comparing weekly results for the two choices. Finally, if they don't use calculators, this problem presents them with the opportunity to use a variety of strategies to add monetary amounts.

In an effort to provide you with the opportunity to step into the shoes of your students and see what it feels like to solve this problem and to liven things up and a long, cold winter, I'm offering a \$10 gift card to Dunkin Donuts to the first person who can email me the correct answer to all three questions. You must provide me with your work, no answers only!! Deadline is Friday, April 10 at 5pm.

"Which Is the Better Deal?" edited by Ed Enns in *Teaching Children Mathematics*, February 2015 (Vol. 21, #6, p. 328-330), [www.nctm.org](http://www.nctm.org); Enns can be reached at [ed\\_enns@wrdsb.on.ca](mailto:ed_enns@wrdsb.on.ca)

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|-------------------------|
| A 21ST CENTURY LEARNER: |
| QUESTIONS               |
| PERSEVERES              |
| DEBATES                 |
| RESEARCHES              |
| SPEAKS CLEARLY          |
| READS CRITICALLY        |
| SYNTHESIZES             |
| COMPOSES                |
| INVESTIGATES            |
| EXPLORES                |
| EXPERIMENTS             |
| PLAYS                   |
| COLLABORATES            |
| SEEKS OUT EXPERTS       |
| METACOGNATES            |
| SHARES                  |
| IS AWARE OF CONTEXT     |
| TAKES MULTIPLE PATHS    |

2. the 2014-15 median SGP, based on PARCC scores<sup>1</sup>; and
  3. The 2015-16 median SGP based either on PARCC or MCAS - whichever is the Commonwealth's assessment at that point.
- If the educator's 2014-15 PARCC-based SGP is lower than the 2013-14 MCAS-based SGP, then the evaluator will discount the 2014-15.
  - PARCC-based results and instead use the 2013-14 MCAS-based SGP and the 2015-16 state assessment-based SGP, along with data from District-Determined Measures to determine the educator's Student Impact Rating.

By considering three years of growth data for these educators, evaluators will know whether the 2014-15 PARCC-based SGP confirms or is contrary to the 2013-14 and 2015-16 SGP results.

If the 2014-15 PARCC-based median SGP is consistent with the other two years, this is a strong signal about the educator's impact on student learning. In the case of teachers who transfer to a new district in 2014-15, evaluators should still include the MCAS-based SGP measures from 2013-14.

## Generating Truly Useful Data in a School Library

In this article in *Knowledge Quest*, Joyce Kasman Valenza (Rutgers University) describes the “output measures” she once collected as a school librarian: books checked out, student visits to the library, reference questions answered, classes taught, and teacher collaboration.

Valenza compiled the data in colorful charts and professional-looking reports to justify her budget, maintain staffing, and advocate for the program. But the process troubled her. Not only did it encourage “systemic competitive cheating” – it didn’t tell about the most important events in her library for students and colleagues:

## PARCC SGP – a Memo from DESE

### Calculating 2014-15 PARCC Student Growth Percentiles

For districts that administer PARCC in 2014-15, DESE will generate Student Growth Percentiles (SGPs) at the student, teacher, school, and district levels. The PARCC SGPs will take into account prior student achievement on MCAS in a manner parallel to the approach used to generate MCAS SGPs. We anticipate that PARCC SGPs will carry the same significance as MCAS SGPs:

### Employing 2014-15 PARCC Student Growth Percentiles

In light of this initial year of PARCC administration, DESE recommends the following:

- When determining Student Impact Ratings in 2015-16, evaluators will examine **three** SGP data points, if available, for educators who administer PARCC in 2014-15:
1. the 2013-14 median SGP, based on MCAS scores;

- *Selecting quality sources;*
- *Asking good questions;*
- *Synthesizing information;*
- *Ethically and creatively constructing and communicating new knowledge;*
- *Addressing administrators' achievement concerns;*
- *How engaged teachers were in the library's resources.*



"I missed the connection between data and results and lost sight of essential questions," says Valenza.

***"How does my work make a difference in improving teaching and learning? What is my value to the learning culture? How might I use evidence to improve my practice and enhance learning?"***

To get feedback on how she was doing on these core outcomes, Valenza began to conduct focus groups of 6-10 seniors. Among the questions she asked: *What have you learned about finding information? Which databases have been most useful? How do you know when you've found a quality source? What have you learned about communicating what you learned during your research?*

*What did you use on our library website and what improvements would you suggest? What parts of the research process do you feel are the most challenging? Do you feel ready for university research? What will you miss most about our library? What is the one thing you most wish you could have changed about our library?*

End-of-year interviews are useful, but Valenza has found that ongoing, formative evidence-gathering is better for making immediate improvements in a library program. Here are her suggested approaches; with tech tools for each (her article has a much longer list of tools):

- **Exit slips** – Here are some prompts to get quick reactions from students on index cards or sticky notes (or using clickers) at the end of a class or project:

- Share three takeaways from today's class.
- What did you or your group accomplish this period?
- What were the best sources you discovered today?
- Which criteria did you use to evaluate the resources you selected today?
- How might you apply what you learned today to a situation outside school?
- I didn't understand...
- I would like to learn more about...



Sorting through exit slips can provide immediate insights about challenges faced by an entire class or by specific students – and ways to fix them in subsequent classes. Valenza recommends several paper-free exit ticket products, including Exitticket <http://exitticket.org>, allowing real-time feedback and performance metrics, and responses can be shared with multiple teachers.

- **In-depth surveys** – For some issues (plagiarism, for example), an anonymous online survey is the best way to gather information and decide what action to take. Google Forms <https://docs.google.com/forms> and Survey Monkey [www.surveymonkey.com](http://www.surveymonkey.com) work well.

- **Examining student work** – “Student work talks,” says Valenza. “It may talk louder, more eloquently, and more authentically than test results, and it could be our most important and most overlooked data.” It tells about the performance of individual students and groups of students, the clarity of instructions and rubrics, and the effectiveness of instruction – and students’ prospects on high-stakes assessments. And if 20 percent of students didn’t meet our objectives, it gives us clear direction on what to do next. Some possible focus areas: students’ ability to discern point of view, identify compelling evidence, find relevant high-quality sources, construct an argument, introduce and embed quotes, synthesize resources, and organize information. Google Classroom [www.google.com/edu/classroom](http://www.google.com/edu/classroom) simplifies creating, collecting, and sharing student work.

- **Transparent instruction and planning** – Google Docs and Google Sheets allow librarians and teachers to collaborate on units and lessons in remote locations and then, after trying them out with students, ask *What worked?* and *What can we do better next time?* and make edits. Many librarians are also using blogs to share their experiences, student projects, and reflections on their practice. This Pinterest board gives access to several library bloggers:

[www.pinterest.com/joycevalenza/teacher-librarian-bloggers-and-other-blogging-frie](http://www.pinterest.com/joycevalenza/teacher-librarian-bloggers-and-other-blogging-frie).

- **Analytics** – Tools like LibGuides <http://help.springshare.com/lgstats> can help Librarians gather data and identify strengths and areas for growth – and which investments are paying off in measurable student learning.



- **Using a camera** – Still and video cameras can capture images of library programs, displays, author visits, other events, and how the space is being used. Student photographers can help, and images can be shared via Flickr, Pinterest, and YouTube. The app Hyperlapse <http://hyperlapse.instagram.com> allows time-lapse filming of activity in a library.

- **Displaying and sharing evidence of practice** – Digital storytelling, an interactive poster, or an infographic can get the word out. Valenza recommends several platforms, including Thinklink [www.thinklink.com](http://www.thinklink.com), Infogr.am <http://infogr.am>, and Piktochart <http://piktochart.com>.

- **Bad news is not bad** – “Not all evidence is going to be pretty,” says Valenza. “Exit interviews, for me, were sometimes profoundly disappointing... Bad news presents a baseline, a realistic situation upon which you build a plan of action and grow as a professional.”

“Evolving with Evidence: Leveraging New Tools for EBP” by Joyce Kasman Valenza in *Knowledge Quest*, January/February 2015 (Vol. 43, #3, p. 36-43), [www.ala.org/aasl](http://www.ala.org/aasl); Valenza can be reached at [joycevalenza@gmail.com](mailto:joycevalenza@gmail.com).