

---

# ▲ APPROACHES TO INTEGRATING THE PROVINCIAL GRADE 9 MATHEMATICS ASSESSMENT INTO AN EFFECTIVE CLASSROOM ASSESSMENT STRATEGY

MARTHA J. KOCH

E-MAIL: martha.koch@umanitoba.ca



*Martha Koch is a mathematics education researcher with an interest in assessment practice, teacher professional development, and innovative approaches to curriculum design and implementation. After conducting research in Ontario for a number of years, she has recently*

*become an Assistant Professor in the Faculty of Education at the University of Manitoba. She teaches courses in mathematics education and educational research methods and is an executive member of the Canadian Assessment for Learning Network (CAfLN).*

---

Large-scale testing and classroom assessment are often viewed as fundamentally different activities in terms of their purpose, administration, and technical qualities. In Ontario, Grade 9 mathematics teachers have a unique opportunity to bring these two activities together. These teachers have the option of scoring some or all of the items on the Education Quality and Accountability Office (EQAO) Grade 9 Assessment of Mathematics before returning the test booklets for official scoring, and they can include the scores from the assessment as part of their students' grades (EQAO, 2013; Ontario Ministry of Education [OME], 2010). Teachers who decide to use the assessment for this purpose choose the items they want to score, create their own scoring guides, and determine how much the assessment will contribute to each student's grade. Teachers must also decide how the EQAO items they have chosen to score align with the Achievement Chart categories in the mathematics curriculum (OME, 2005). In some schools, individual teachers make these decisions based on the needs of the students in their classroom. In other schools, the decisions are made collaboratively, with all teachers in the department following the same approach (Koch, 2010). While many teachers choose to include the

assessment within the 30% summative part of students' grades, EQAO and Ministry policies do not preclude using the assessment in the 70% term grade (EQAO, 2013; OME, 2010).

Various aspects of teachers' use of the EQAO Grade 9 Assessment as part of students' grades have been investigated by EQAO (Kozlow, 2011, 2012; Pang, Kozlow, & Rogers, 2012) and by mathematics education researchers (Kitto, 2006; Koch, 2010). To further explore this practice, in this article, I draw on interviews I conducted with 17 Grade 9 mathematics teachers, who describe how they use the EQAO assessment in their students' grades. More specifically, I share examples of innovative practices these teachers have developed. These practices are aligned with *Growing Success* (OME, 2010), Ontario's assessment policy, and they also reflect established research on effective assessment practice (Assessment Reform Group, 2002). The practices that are described relate to three principles from *Growing Success*: assessment should be fair and equitable for all students; teachers should provide multiple opportunities for students to demonstrate their learning; and students should have opportunities to develop their self-assessment skills. As will be shown, the teachers in this study strive to ensure that the way they include the EQAO Grade 9 Assessment in students' grades is consistent with their overall classroom assessment strategy and helps to improve students' mathematics learning.

## Data Gathering

Before describing the ways these teachers use the EQAO assessment, I provide some background information about the participating teachers and the data-gathering process. The 17 teachers interviewed (11 female, 6 male) were from four school boards (two small rural boards, one mid-sized urban board; one large urban and suburban board) and had a range of teaching experience from two to 25 years. Six of them had been mathematics department heads at some time in their careers. Two of the teachers were using the EQAO Grade 9 Assessment as part of their students' grades for the first time, while the others had included the assessment in students' grades on numerous occasions. Most had used the EQAO assessment for grades in both the Academic and Applied Grade 9 mathematics courses. In addition, many had experience teaching in more than one school and had seen a variety of approaches for including the assessment in grades.

Individual interviews were conducted with each teacher. Teachers were asked to describe how they use the EQAO Grade 9 Assessment in their assessment practice, their reasons for doing so, and any concerns they have with this use of the assessment. The interviews were an average of 33 minutes in duration and were audio-recorded and transcribed for analysis. The analysis of the interview transcripts provides many valuable insights into how and why teachers use the EQAO assessment in their students' grades, as well as their concerns about certain aspects of the assessment, such as the high proportion of multiple-choice items and the limited value of the assessment for students taking the Applied course. In this article, I focus on several practices these teachers engage in that instantiate the three *Growing Success* assessment principles mentioned earlier.

In reading this article, Grade 9 mathematics teachers and mathematics department heads are invited to reflect on their use of the EQAO assessment, discuss the implications of other possible approaches, and consider the merits of incorporating one or more of the approaches described in the article in their assessment practice. A few of the practices that are described will surprise some readers and may foster a renewed debate about the ways Ontario's assessment policy can be interpreted and enacted.

## Observations

### Fair and Equitable for All Students

*Growing Success* indicates that teachers should make assessment decisions for individual students and for groups of students that are fair and equitable. Many of the practices the teachers in this study have developed help to ensure that their use of the EQAO assessment meets this principle. In this section, I focus on three dimensions of these teachers' use of the assessment where fairness and equity are particularly evident: the selection of items to score, decisions with regard to the amount the assessment contributes to grades, and how teachers develop scoring guides for the open-response items.

Although I present a number of individual teacher's practices, I want to point out that the extent to which individual teachers make decisions regarding how the EQAO assessment is used in grades varied considerably among the teachers in this study. Some teachers indicated that these decisions are made at the departmental level to ensure that all teachers score the

same items in the same way, and weight the EQAO assessment for the same amount in students' grades. In these cases, the mathematics department head felt that consistency across teachers is an essential element of fair and equitable assessment practice. In other cases, teachers indicated that some decisions are left to individual teachers within the department. For instance, individual teachers choose which items to score and establish their own scoring guide, but all teachers in the department weight the assessment for the same amount. However, there were also cases where each teacher within the department was encouraged to use his or her judgment to make decisions about item selection, scoring, and weighting based on the characteristics of the students within their classrooms. In these cases, the mathematics department head ascribed to the view that fair and equitable treatment of students does not necessarily mean using the same approach for every student.

The teachers interviewed used a variety of approaches to select which EQAO items to score. Among the 17 teachers in the study, 4 indicated they score only the multiple-choice items, 12 score a selection of both the multiple-choice and open-response items, and 1 teacher prefers to score only the open-response items. Though individual teachers may choose to score different item types, everyone interviewed indicated that they do not score items they feel they have not adequately covered during the course, or items that are worded in ways their students might find confusing.<sup>1</sup> For example, one teacher states, "What I plan on doing is taking the EQAO test after they're done writing it and selecting the questions that I feel best represent the course" (Shannon interview, p. 1).<sup>2</sup> Similarly, another teacher indicates, "One thing I did this year that I hadn't done in the past is I noticed there was a pattern; there was one question that I chose to mark and none of my Applied kids got it, so I just took it off" (Whitney interview, p. 3). And a third teacher states, "Because I'm selecting which questions, if a topic hasn't been covered or... if it's different from how I would teach it in class or I don't think it's relevant to what I did in my classroom or aligned with what we did, then I like to be able to remove that" (Leslie

---

<sup>1</sup> At the same time, almost every teacher interviewed commented on the high quality of EQAO items, and many indicated that they use some of the released EQAO items as learning activities in their classrooms.

<sup>2</sup> All participating teachers have been given pseudonyms to help ensure anonymity.

interview, p. 5). Several of these teachers went on to explain that they had not intentionally omitted or overlooked aspects of the curriculum, but rather, that unexpected events (illness, snow days, school closures, etc.) sometimes resulted in a concept being covered in less depth than they would have liked. In essence, these teachers avoid using EQAO items that cover material their students have not had an adequate opportunity to learn.

Fair and equitable treatment of all students is also a key factor for many of these teachers when deciding on the amount the assessment contributes to their students' grades. For instance, one teacher counts the assessment as 5 percent of most students' final grades, but does not include the assessment in the grades for some students in his class. As he explains:

There are a couple of girls who do very well in assignments so far and haven't done very well on tests, whether it's anxiety or other things, so what I am planning on doing with them is... having an alternate assignment that basically would be based on what you would learn from the EQAO, and that way, they can demonstrate [their learning]. (William interview, p. 2)

In making different decisions about how the assessment contributes to grades based on his individual students' needs, William is demonstrating that equitable assessment practice does not mean using exactly the same approach for all students, and that assessment can be used to support each students' mathematics learning.

Similarly, another teacher reported that she counts the assessment as the equivalent of two quizzes within the term grade for students in her Grade 9 Applied mathematics class, rather than as part of the summative grade.<sup>3</sup> She explains:

I know there has been talk at some point about counting it as part of their culminating or doing something else, but because I don't find EQAO is geared to the way I teach my students, the questions aren't worded the way that I word my questions to my students, I don't believe in taking that and putting it in the culminating activity mark, which weighs more heavily... EQAO is not designed for Applied students. The whole thing with Applied students is that they're not test

writers, most of them. I find just the whole idea of this big two-day test for them is a bit overwhelming sometimes, and so I'm definitely more lenient with theirs. (Margot interview, pp. 1–2)

Margot went on to explain that she counts the assessment as a greater portion of grades in the Academic course because she feels students in that course have stronger test-writing skills. Other teachers indicated that they are careful to balance the amount the assessment contributes to grades so that it motivates students as they complete the items, but does not create undue stress or overwhelm them.

A third aspect of these teachers' practices that focuses on fair and equitable treatment of students is the way that teachers develop scoring guides for the open-response items. Each of the teachers who mark the open-response items explained that they develop scoring guides that are consistent with the way they score similar items on the unit tests they develop. For instance, one teacher states, "For the long-answer questions, I would assess them based on how I've been assessing on all my tests" (Shannon interview, p. 2); and another states, "I just go through and I [mark] based on if I were to set the test, what would I be looking for in their answer" (Margot interview, p. 2). These teachers, as well as several others who mark the open-response items, went on to explain that they feel that using a scoring approach their students are familiar with increases the fairness of including the EQAO items in students' grades.

In all of these examples, we see that teachers are focused on using the EQAO Grade 9 assessment in ways they consider to be fair and equitable for their students. In some cases, this means that different approaches are taken for individual students within a class or for students taking different mathematics courses (i.e., Applied versus Academic). In addition, these teachers carefully consider the teaching, learning, and assessment they have used throughout the course as they make decisions about their use of the EQAO assessment. Thus, while the EQAO assessment is a standardized test when it is administered and scored as part of Ontario's accountability system, these teachers use their judgment to make context-specific decisions that meet the needs of the students in their classroom.

### **Providing Multiple Opportunities to Demonstrate Learning**

According to *Growing Success*, teachers should use assessment practices that "are ongoing, varied in nature,

<sup>3</sup> Four of the 17 teachers (from two different participating districts) include the EQAO assessment in the term part of the grade, rather than in the summative grade.

and administered over a period of time to provide multiple opportunities for students to demonstrate the full range of their learning” (OME, 2010, p. 6). It may seem counter-intuitive that this principle could be addressed through the use of student responses to items on a large-scale test. However, three of the teachers I interviewed explained that they treat the EQAO Grade 9 Assessment as an additional opportunity for students to demonstrate their learning, rather than deciding in advance on a certain percentage that the assessment will contribute to all students’ grades.

One teacher I interviewed described how most of the teachers in his department use the responses to the EQAO items as additional evidence to help them come to a judgment of each student’s understanding for each overall learning expectation. To begin this process, the teachers get together to decide which overall learning expectation from the Ontario curriculum is most closely aligned with each item on the EQAO assessment. Then, they review the assessment information they have gathered for each student during the semester. They identify those overall learning expectations where they feel they need additional evidence to help them determine the most consistent level of understanding for a given student, and then examine that student’s responses to the related EQAO assessment item(s). As Philip explains:

What I use the EQAO most for, or where it’s most influential is for students who have not shown me evidence that is passing the expectations. Then that’s usually where I’m depending more on the EQAO ’cause it is sort of their last chance to show me that they understand something. And so if they’re able to show me something good there, I’m able to say that’s at least a pass for that overall expectation. (Philip interview, p. 4)

Thus, rather than deciding on a fixed percentage that the EQAO assessment will contribute to every students’ grade, and using the same selected items for every student, the EQAO assessment items are used to help the teachers at this school judge each student’s level of understanding of the overall learning expectations.

A teacher from another board described a related practice where she scores all the EQAO items for a particular mathematics topic where she has not had a chance to gather as much assessment evidence during the semester. For instance, one year, she had not had time to gather enough assessment evidence for geometry, so she scored all of the EQAO multiple-choice

and open-response items related to geometry and included the results as part of the term grade for that unit. In another example, a teacher explained that she decides which EQAO items to score on a student-by-student basis. For instance, if a particular student was absent for a significant time period during the semester and had limited opportunities to demonstrate his or her understanding of a particular curriculum area, she can look at the student’s EQAO responses to gather additional insights about his or her understanding of that mathematics content area.

In each of these practices, we see that rather than using a one-size-fits-all approach, these teachers have developed strategies where the EQAO assessment items become another of the multiple opportunities they give students to demonstrate their mathematics learning.

### Developing Self-Assessment Skills

Both *Growing Success* (OME, 2010) and many research-based descriptions of effective assessment practice (Assessment Reform Group, 2002) emphasize the positive impact of self-assessment on students’ learning. While a provincial assessment may not seem like an opportunity for developing self-assessment skills, several of the teachers I interviewed have found ways to do this. In some cases, students engage in self-assessment before taking the test, and in other cases, the self-assessment activities take place after the test is written.

One teacher has students in his Grade 9 Academic mathematics class develop study guides for one another as a way of preparing for the EQAO assessment. Working in teams, his students are asked to reflect on what they know best and what they are less confident with from the course material. They then choose one area of the curriculum to become experts in and develop review questions for one another to complete. Emphasis is placed on students becoming more aware of their own level of understanding for each content area and focusing their review efforts on their areas of need. Another teacher described how immediately after writing the EQAO assessment, she has students in her Grade 9 Applied mathematics course reflect on what they did and did not know as they completed the EQAO items, to help them determine the areas they need to focus on to prepare for their in-school final examination. She states:

I’m really big on metacognition. [I tell the students] “So now when you look at the kinds of things you couldn’t do on the EQAO, now you know where to



study for your exam” ... they know which ones they did well on and which ones they didn’t ... It helps them to know what they know ... I get kids to commit to the unit or strand that they want to work on, and then I can have stations set up ... they can work together ... to think about the kinds of problems that they’re having the most trouble with. So, you can tailor their review to what they actually need to work on, and they’re more willing to work when you do that. (Diane interview, p. 29)

Another teacher has a class discussion after her students complete the EQAO test to enable the students to decide which items she should include in their grades. Similarly, another teacher explained that she allows individual students to indicate which open-response items they would like her to score by identifying the items they think they completed successfully.

Each of these practices shows how the EQAO assessment can be integrated within a teacher’s classroom-assessment strategy to ensure that students are actively engaged in the assessment process and have an additional opportunity to reflect on what they know and where they need to continue working. In these instances, the EQAO test, which is often seen only as a summative assessment, is also serving as a formative assessment tool that helps to improve students’ mathematics learning. In fact, these approaches demonstrate how the EQAO assessment can be used to support students’ learning, even though teachers are not permitted to provide students with detailed feedback on their responses to the EQAO items.

## Closing Remarks

The teachers who participated in this study describe how they use their professional judgment to develop a coherent classroom-assessment strategy that includes the EQAO Grade 9 Assessment. They have developed practices that align with current assessment research and with the principles of Ontario’s assessment policy. Many of these teachers have combined assessment of, as, and for learning in interesting ways as they make decisions to support their students’ learning. For some, the EQAO assessment is another opportunity for students to demonstrate their understanding of the curriculum expectations. The EQAO assessment can be used in flexible ways to meet the needs of individual students or groups of students, and provide feedback to guide students’ ongoing learning at the same time that it is used to help teachers determine report card grades.

## References

- Assessment Reform Group. (2002). *Assessment for learning: Research-based principles to guide classroom practice*. Retrieved from <http://cdn.aiaa.org.uk/content/uploads/2010/06/Assessment-for-Learning-10-principles.pdf>
- Education Quality and Accountability Office. (2013). *Administration guide, grade 9 assessment of mathematics*. Toronto: Queen’s Printer for Ontario.
- Kitto, R. J. (2006). *Teacher perceptions of the validity of a large-scale mathematics assessment instrument* [Doctoral dissertation]. University of Western Ontario, London, ON, Canada.
- Koch, M. J. (2010). *Implications of the multiple-use of large-scale assessments for the process of validation: A case study of the multiple-use of a grade 9 mathematics assessment* [Doctoral dissertation]. University of Ottawa, Ottawa, ON, Canada.
- Kozlow, M. (2011, December). Counting the EQAO grade 9 mathematics assessment for course marks makes a difference in student results. *EQAO Research Bulletin, 9*. Retrieved from [www.eqao.com/Research/pdf/E/ResearchBulletin9\\_en.pdf](http://www.eqao.com/Research/pdf/E/ResearchBulletin9_en.pdf)
- Kozlow, M. (2012, May). Factors that are related to student achievement on the EQAO grade 9 assessment of mathematics. *EQAO Research Bulletin, 11*. Retrieved from [www.eqao.com/Research/pdf/E/ResearchBulletin11\\_en.pdf](http://www.eqao.com/Research/pdf/E/ResearchBulletin11_en.pdf)
- Ontario Ministry of Education. (2005). *The Ontario curriculum, grades 9 and 10: mathematics* (revised). Toronto: Queen’s Printer for Ontario.
- Ontario Ministry of Education. (2010). *Growing success: Assessment, evaluation, and reporting in Ontario schools*. Toronto: Queen’s Printer for Ontario.
- Pang, X., Kozlow, M., & Rogers, T. (2012, May). *An analysis of questionnaire and contextual data for grade 9 students in the academic and applied mathematics courses*. EQAO Research Report retrieved from [www.eqao.com/Research/pdf/E/Analysis\\_Questionnaire\\_ContextualDataG9\\_en.pdf](http://www.eqao.com/Research/pdf/E/Analysis_Questionnaire_ContextualDataG9_en.pdf) ▲

*Mathematics has beauty and romance. It's not a boring place to be, the mathematical world. It's an extraordinary place; it's worth spending time there.*

*Marcus du Sautoy*

*In mathematics the art of proposing a question must be held of higher value than solving it.*

*Georg Cantor*

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.