**The Algebra II Problem: A Call for Change**

Steve Newman and Mike Waters

The time has come to address The Algebra II Problem in Kentucky. At the heart of the Problem is the ACT QualityCore End-of-Course (EOC) assessment in Algebra II that is required of *all students* and is the sole measure of achievement (proficiency) in high school mathematics. This assessment covers an extraordinary number and variety of topics, including topics that are optional in the Kentucky Core Academic Standards (KCAS) for high school mathematics, several topics that are not in the KCAS, and advanced topics in KCAS for which Algebra II is generally considered a prerequisite.

It is therefore not surprising that every one of the 50 teachers who responded to the survey at the September 9 KYOTE dinner meeting agreed with the statement that “*There are too many topics to cover for the ACT QualityCore EOC assessment in Algebra II to do so effectively”* and with the statement that “*The Algebra II course will be significantly improved by covering fewer topics in greater depth.*” The response was robust and unequivocal, with 47 of the 50 teachers strongly agreeing with both statements.

One teacher used a particularly vivid analogy that captured the sentiments of many other teachers: For too many students who take this test, “*it's like taking a drink of water out of a fire hydrant; they are overwhelmed and exhausted and their thirst hasn't been quenched. Honestly- it leaves them frustrated and with the feeling that they are incapable of being successful at math; I feel like I am doing a disservice to them*.”

There was also considerable concern expressed about transparency regarding the content and especially the grading of this assessment. Teachers in one group spoke for many of their colleagues: *Teachers feel at a severe disadvantage when they are not permitted to see EOC tests; only a few released items are available and teachers feel they are not a representative sampling of items*.

The grading of the assessment is particularly opaque. No one present at the meeting knew for certain how the normalized scores that determine the student grade on the assessment relate to the raw scores (the number of correct answers). Everyone present agreed that the grading scale has been set remarkably low due to the difficulty of the exam. This is troubling since it is recommended that the grade on this assessment count for 20 percent of the grade students receive in the course.

An explanation of the grading is in order. There are 70 multiple-choice questions on the assessment and each question has only four possible answer choices. (The ACT, KYOTE and COMPASS questions have five possible answer choices.) Thus, students who randomly guess on each question should on average get 17.5 questions correct. Yet apparently only students who get fewer than 14 questions correct get a failing grade on the assessment. Statistically, students who randomly guess on each question have an 87% chance of passing. And apparently students who get more than 50 percent of the questions correct on the assessment receive an A.

It is clear that very few students are mastering the content assessed and that teachers are struggling to cover all this content in a meaningful way. It is equally clear that the assessment is driving the curriculum in Algebra II courses. Teachers are only covering certain topics because they are assessed, not because they feel that these topics are useful or helpful for their students. Teachers in one group expressed their feelings succinctly: *Testing what is TAUGHT is much preferred to teaching what is TESTED*.

The Algebra II Problem in Kentucky can never be completely solved, but significant progress towards a solution can and should be made. In our paper *Common Sense for Common Core*, we suggested several topics that should be removed from an end-of-course assessment in order to focus an Algebra II course and enable teachers to cover fewer topics in greater depth. Teachers made suggestions about additional topics that should be removed. These suggestions are in the meeting minutes.

Teachers could always choose (and are encouraged) to cover additional topics in their Algebra II courses beyond those on an end-of-course assessment. But we agree with what one teacher wrote about end-of-course assessments: namely, that they should only assess topics that teachers can cover effectively in that course. An end-of-course assessment should not be like the ACT that assesses a wide variety of topics that covers an entire span of courses from middle school through high school.

Focusing an Algebra II course on fewer topics to be covered in greater depth should not be an impossible task. The KYOTE and COMPASS college placement exams are end-of-course assessments for senior-year transitional courses. In mathematics, these exams are focused on the essential algebra, arithmetic and simple geometry students need to become college ready. The transitional courses and placement exams are challenging, but achievable, for struggling students. At the same time, students must show greater understanding of this content in order to pass than is the case on the Algebra II assessment. Students must get more than 70 percent of the answers correct on the KYOTE math exam to pass and become college ready.

This model, first created and piloted in the Northern Kentucky region, has served Kentucky well in getting significantly more high school students ready for college. It is a critically important part of Kentucky’s College and Career Readiness program, the finest in the nation.

The achievement component of the accountability system in high school mathematics, however, can and should be significantly improved. The feedback we are providing is timely and actionable. Kentucky is reviewing and making improvements in its assessment and accountability system this year, five years after Senate Bill 1 was passed. Commissioner Holliday discussed this in his September 12 blog. Our collective voices should be considered in this process. Our teachers deserve it. Our students deserve it. We cannot wait another five years.

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