

## Formative Assessment and Student Learning

*If my students had x, y-axis white boards, I could formatively assess their comprehension of graphing various types of functions with a quick glance providing important student-driven data to inform instructional decisions.*

I am in my second year teaching high school math at Leipsic High School in Putnam County, Ohio. I teach a pre-algebra course for freshman, a 4<sup>th</sup> year math modeling course, and Algebra II. I love being able to challenge my students on a daily basis using hands-on, project-based learning, and it is important to me that my students are engaged in the lesson. For example, my students regularly collect their own data to analyze with functional models via different methods such as motion detectors. Teaching with project-based learning has transformed my practice and encourages my students to become active learners.

In order to keep my students engaged, I use various forms of evaluation, especially formative assessment. During my teacher education program, I found the importance of formative assessment, a type of evaluation used by teachers to reveal the level of student understanding on an individual basis. It could be in the form of vocal responses, thumbs up/thumbs down, or 3-2-1 self-assessment. Solely based on student comprehension, these types of assessments inform instructional decisions, such as whether to review a topic or to challenge the students with more complex problems.

In my math courses, I conduct multiple forms of formative assessment to understand how my students are learning. My favorite method of formative assessment is using personal white boards. Last summer, I purchased, with personal funds, shower board from a local hardware and asked my father to cut the board into 8x12" rectangles. Once the board was cut, I taped the edges with brightly colored duct tape. I use these homemade individual white boards on a daily basis with my students; yet, these boards do not always function the best for my students.

During my math classes, I require the students to complete practice problems after presenting a few examples. As a pair, the students work through those problems on the individual white boards. Once they are finished, they hold up their worked out solution for me to evaluate. This keeps the students engaged and allows them to explore the process I am teaching with a partner. I am able to quickly assess my students' ability to work out the given problem before moving to individual practice. However, those white boards do not have a coordinate plane (an x-y axis).

When I teach graphing, practicing with their partner becomes difficult on the homemade white boards because of the lack of a coordinate plane. Students have tried to make a coordinate plane on the boards themselves, but this usually leads to inaccurate placement of data points resulting in an incorrect answer. Many students, then, become discouraged in their ability to graph which tends to be a more difficult concept, regardless. It is a shame, as these issues could be rectified if the white boards had a coordinate plane.

This becomes a huge problem specifically for Algebra II students. Before this course, the students have a basic knowledge of graphing linear and quadratic functions. The Algebra II

curriculum requires the students to graph higher power functions and their inverses (logarithmic and root functions). If they are not exact, their resulting graphs are incorrect. Therefore, I end up having the students graph practice problems in their notes on graph paper and spend extra time walking to each student desk individually for evaluation. This time could be saved if the students had individual white boards with coordinate planes. Additionally, the students would feel more confident in their graphing ability as they would be more accurate if a coordinate plane was on their white board.

If my students had x, y-axis white boards, I could formatively assess their comprehension of graphing various types of functions with a quick glance providing important student-driven data to inform instructional decisions in seconds.

Thank you for your consideration for the WRITE Program grant.

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