Measuring Alternative Means of Expression

Tools for Measuring Proficiency Across Assessment Mediums

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Introduction

With the California School Dashboard being able to distill down to indicators of progress at the student group level, schools and school systems are becoming more aware of the need to implement approaches that effectively support students with disabilities to successfully graduate with a high school diploma. One significant challenge faced by these students is achieving credit toward graduation in Algebra I or Mathematics I. Traditional assessment methods, such as quizzes and tests, often fail to capture the full range of student learning and can create inequities within the classroom. These measures may not be flexible enough to accommodate diverse ways in which students can demonstrate their proficiency and express their understanding of the subject matter. Additionally, relying solely on tests and quizzes limits the ability to tailor educational programming to be inclusive of a wide array of student populations including those with disabilities. This practice brief describes ways to incorporate alternative means of expression to students using proficiency rubrics grounded in equitable grading practices, using Algebra I and Mathematics I concepts as examples.

Assessment Practices Supporting Students with Disabilities

California educators have expressed a heightened interest in approaches that support students with disabilities to graduate with a high school diploma, noting that achieving credit toward graduation in Algebra I or Mathematics I has been a significant obstacle for students with disabilities. Traditional measures, such as quizzes and tests, can create inequities in the classroom, as they often measure a narrow scope of the content and may not be flexible enough to account for varied ways students can demonstrate and express their learning. Furthermore, using only tests and quizzes restricts the individualization of the educational programming that is defined within the individualized education programs (IEPs) of students with disabilities. Using proficiency rubrics rooted in equitable grading practices provides greater individualization and support for students with disabilities and allows them to have alternative means of expression to demonstrate proficiency that reaches beyond the traditional test format (Leich 2023). Furthermore, chapter 12 of Mathematics Assessment in the 21st Century of the *California Mathematics Framework* (2023) encourages educators to deploy a wide array of assessment types to support students having varied ways to show their understanding of concepts (California Department of Education [CDE] 2023). This chapter emphasizes criteria for designing clear assessment expectations and also provides various examples of rubrics and how they can be used in mathematics instruction and assessment. This practice brief will focus specifically on proficiency rubrics.

Proficiency Rubrics Grounded in Equitable Grading Practices

A proficiency rubric objectively describes the learning progression along which students move toward proficiency with a particular learning goal. Students use the rubric to identify the components of the learning goal, where they are within those components, and what next steps they can take to reach proficiency (Brookhart 2013). This measurement approach improves students’ self-regulation, motivation, and engagement, and it reduces their dependence on the teacher. The clarity and transparency of a proficiency rubric, for both formative and summative assessments, reduces the inequities that exist in traditional measures by focusing on the learning standards and success criteria while actively engaging the students in their learning. Furthermore, this practice helps students, teachers, and even IEP teams (where applicable) define what alternative means of expression options are viable and which are not, based on the degree to which they satisfy the components of proficiency defined within the rubric.

To implement proficiency rubrics, teachers must clearly define the success criteria, align the criteria with the standard’s learning objectives, and explicitly communicate the criteria to students (Townsley and Wear 2020). These criteria often fall along a series of levels, such as emerging, developing, approaching, and proficient, and they clearly articulate where a student is on the learning progression (Leich 2023). When collaboratively developed, the rubrics allow teachers to collectively design alternative means of expression for students with disabilities. Table 1 below is an example of a proficiency rubric with associated success criteria for an Algebra I standard. This rubric uses objective language and adheres to the goal of determining the student’s proficiency with the standard along the learning progression. The success criteria provide teachers the opportunity to consider a wide range of means of expression through which students with different strengths, abilities, backgrounds, and preferences might demonstrate proficiency. Table 2 below expands on the table 1 rubric to show an example of alternative means of expression across and within the various levels of the rubric.

**Big Idea: Modeling with Functions and Comparing Models Content Connections: Reasoning with Data and Exploring Changing Quantities Standard: A.CED.1:** Create equations and inequalities in one variable and use them to solve problems.

Table 1. Proficiency Rubric Example

|  |  |
| --- | --- |
| Level | Success Criteria  “The student demonstrates that they can…”  *Note—To receive a rating of “proficient,” a student’s response would need evidence for each criterion or element.* |
| Emerging | Summarize the problem and identify the goal—what do we need to figure out?  Identify the relevant quantities in a situation—what in the problem can we count or measure that could help us answer the question? |
| Approaching | Identify the goal of the problem.  Identify the relevant quantities in a situation and assign variables to represent them.  Describe the mathematical relationship between two quantities.  Use variables and mathematical symbols to express the relationship between two quantities as an equation or inequality. |
| Proficient | Identify the relevant quantities in a situation and assign variables to represent them.  Describe the mathematical relationship between the two quantities.  Use variables and mathematical symbols to express the relationship between two quantities as an equation or inequality.  Use the equation or inequality to solve the problem accurately. Identify the solution to the original problem. |

Table 2. Sample Alternative Means of Expression Tied to Table 1

| Proficiency success criteria | Example alternative means of expressing proficiency |
| --- | --- |
| Identify the relevant quantities in a situation | The student could **express** the goal of the problem and the relevant quantities using familiar vocabulary by  **Verbally stating:** “We need to figure out how many months it will take Elias to get enough money to buy a car that costs $8,000, which means we have two quantities that we know and one we do not. The total ($8,000) and how much Elias has to save each month ($300) are ones we know, and how many months it takes him is one we do not know.”  **Typing a description of the goal and relevant quantities on a laptop or tablet** for the teacher to read.  **Using text-to-speech software that narrates** what the student has written to the teacher.  **Recording themself stating the answer** and then **pressing play** to activate text-to-speech software. |
| Describe the mathematical relationship between the quantities | The student could express the quantities and their relationship by  **Verbally stating:** “The relationship between the quantities is that the $300 has to happen multiple times before Elias has the $8,000 needed to buy the car. I need to figure out how many times that might be.”  **Typing a description of the relationship on a laptop or tablet** for the teacher to read.  **Using** **speech-to-text/text-to-speech software**.  **Creating a table or diagram** to show the relationship between the quantities. |
| Use variables and mathematical symbols to create an equation or inequalities that represent the relationship | The student could communicate the connection between the mathematical symbols and the variables to show the equation or inequality represented by  **Creating a picture** of the problem that connects the quantities and variables with symbolic representations.  **Designing a presentation** with the equation or inequality and how each symbol and quantity represents the relationship.  **Demonstrating the problem by** **arranging a set of cards** depicting a selection of numbers, variables, and mathematical symbols (for example, +, -, =, ≥) **on a desk or board to create an equation** **or inequality** that accurately represents a mathematical relationship and could be used to solve the problem(*see graphic below*).  An assortment of moveable cards depicting various dollar amounts, variables, and mathematical symbols (plus sign, minus sign, division sign, multiplication sign, equals sign, greater than or equal to sign). At the bottom, arrows indicate how someone might select and move around the cards to form the expression “300M >= 8000”. |
| Use the equation or inequalities to solve the problem | The student could express the solution by  **Talking through the equation or inequality verbally** **by stating:** “If *m* is 10, then he has 10 \* $300, or $3,000. So that is not enough; 20 \* $300 is $6,000, which is still not enough; 30 \* $300 = $9,000. That means by 30 months, he has enough plus extra, so the answer has to be between 20 and 30—25 \* $300 is $7,500—close, but not quite enough. In one more month, he’ll have $7,500 + $300 or $7,800, and then in one more month, he’ll have $7,800 + $300 or $8,100. That is more than $8,000. So, let’s see; 25 plus two more months is 27. It will take Elias at least 27 months to have enough money to buy the car—*m*\* 300 ≥ 8,000—*m* would be 27 or higher.”  **Verbally describing this equation while also arranging and rearranging additional cards** from the previous set (for example, 10, +, =) to complete the equation.  **Illustrating the guess-and-check method with concrete representations** to determine the numerical solution by drawing it, writing it, or using manipulatives (for example, base-ten blocks, $100 bills).  **Using an input-output table** to solve the problem and showing the solution to the problem. |
| Identify the answer to the original question | The student could communicate the answer by:  **Verbally stating**: “It will take Elias at least 27 months to have enough money to buy the car—*m* \* 300 ≥ 8,000—*m* would be 27 months or more.”  **Recording the answer** and pressing play.  **Using text-to-speech software** to type the answer and say it.  **Arranging a set of cards** to display the answer.  **Illustrating** the answer using **concrete** **representations**. |

These two tables demonstrate achieving the balance between flexible approaches to expressing learning and maintaining the rigor of the content by using a proficiency rubric that expands the measurement options. One proficiency rubric can assess more than one standard: for example, a cluster of standards in a Big Idea. This flexibility can support students with disabilities to demonstrate proficiency in a preferred expression medium, thus allowing the student to achieve credit toward a standard high school diploma and successfully transition to college and career environments.

Conclusion

Implementing alternative means of expression rooted in proficiency rubrics offers a viable solution to support students with disabilities in achieving credit toward graduation in Algebra I or Mathematics I. Traditional measures such as quizzes and tests may create inequities and restrict the individualization of educational programming for these students. Proficiency rubrics provide greater flexibility by allowing alternative means of expression for demonstrating proficiency beyond traditional test formats. By clearly defining success criteria aligned with learning objectives and involving collaborative development, teachers can design varied ways through which students with different strengths, abilities, backgrounds, and preferences can demonstrate their understanding. This approach promotes self-regulation, motivation, and engagement while reducing dependence on teachers. Overall, incorporating alternative means of expression using proficiency rubrics into math courses supports inclusivity and helps pave the way for successful transitions to college and career environments.

References

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