

What Makes This TEAM Reflection Paper Successful?

Some specific examples/ evidence that contributed to the success of this paper are provided below.

Module Four: Online: Assessment

Grade: 4

Subject: Math

Criteria I: Development of New Learning (How the teacher developed new learning and what was learned)

How the teacher developed new learning:

- Reading publications: Common Formative Assessment by Ainsworth and Viegut, Mathematics Assessment edited by Jean Kerr Stenmark, and the NCTM magazine, Teaching Children Mathematics,
- Collaborating with mentor and district math specialist

What the teacher learned:

- There are different uses of formative assessments, “assessments for learning...not to assign a grade” and summative assessments. Using formative assessments, teachers “can analyze results solely to inform instruction.”
- She needed to incorporate “performance assessments that require students to create a product or construct a response which would be highly engaging and open-ended.”
- Student progress can be measured by giving a pre and post assessment that contained the same questions.

Criteria II: Impact on Practice (How the teacher’s practice is different)

- The teacher created and then implemented a “comprehensive pre-assessment that would also serve as a post assessment ...that included a progression of pictorial versus abstract representations of fractions.”
- The teacher integrated periodic probes [formative assessments] “to further plan for differentiating task-oriented flexible groups.”
- “Since results from my assessments showed that about three-fourths of the class had widely ranging misconceptions, I decided to alter my teaching strategies. I moved several students onto an additional activity/game to reinforce the concepts that they already mastered. I also re-taught several concepts of adding fractions with unlike denominators and re-taught how to write about them.”

Criteria III: Impact on Students (How student performance/learning has improved as a result of changes in the teacher’s practice.)

- “The pre-assessment showed that only 4 percent of my class of 22 students scored proficient or higher which is a dramatic difference from the post-assessment in which 64 percent of the same 22 students scored proficient or better. What is even more striking is the fact that on the post-assessment, the average percentage was 71, which is in the proficient range, while on the pre-assessment, the average percentage was 23, which is in the below basic range.”
- “Differentiation of the lesson material following the probes is the main reason that I feel there was such a dramatic improvement in the overall scores between the pre and post assessments.”
- “The probes demonstrated that activities related to real life problem solving were beneficial for those students that achieved mastery, as evidenced by their consistent independent work, enthusiasm and level of engagement. I observed that they sought successive situations in which to apply their knowledge of adding and subtracting fractions.”

Indicator: 1. Teachers use multiple measures to analyze student performance and to inform subsequent planning and instruction by: Using and/or designing a variety of formative and summative assessments and criteria that directly align with the learning objective and value the diversity of ways in which student learn.

Goal:

I will learn to use information gathered from formative and summative math assessments to develop and implement differentiated lessons and strategies for learning so that the percentage of students scoring 'below basic' in adding and subtracting fractions with unlike denominators will increase to 'proficient' or higher as measured by pre- and post- assessments.

Initial Summary:

As I reviewed the CCT Performance Profile and specific indicators with my mentor, I realized that my mathematics instruction relied almost exclusively on summative assessments. Although I differentiate my mathematics instruction, it is not consistently grounded in ongoing formative assessments. My usual classroom practice is to give a summative assessment after teaching a unit, unless I am conducting a specific Scientific Research-Based Intervention (SRBI) with my collaborative team that pertains to specific skills based on results from CMT and Math predictors' data. I evaluate students on the unit objectives, predicating future instruction on repeating or revisiting some lessons, or conducting limited small group work with different contexts and manipulatives. I realize that my students would benefit from more varied assessment tools. Except for a unit on multiplication basic facts and the specific SRBI interventions for subtraction with regrouping, estimation, and measurement, I do not use a wide variety of methods to assess my students.

Reflection Paper:

This module began with an analysis of my current math teaching practice and with an examination of the CCT Performance Profile. Although I understood the difference between formative and summative assessments, and the use of these as best practice, I was not using assessments regularly to inform my teaching. In discussions with my mentor, most of my math units for the year focused on teaching lessons that were differentiated as the lesson progressed, but were structured mostly as whole class instruction. In addition, I only used summative assessments to evaluate and measure students' mastery of the knowledge and skills of the material at the end of each unit. Therefore, with the help of my mentor, I saw the benefits of using multiple measures to assess students' learning and performance. These multiple measures had to be both formative and summative, to

directly align with the learning objectives, and to support my students' varied learning needs. This would drive my daily planning and instruction for a comprehensive set of lessons promoting my students' knowledge of a variety of fraction concepts and ultimately leading to their understanding of fractions with unlike denominators.

Based on my prior knowledge of my students' understanding of fraction concepts, coupled with additional student weakness with fractions, and my analysis of my CCT profile, I sought to create a fraction unit of differentiated tiered instruction based on their needs and learning styles using formative and summative assessments. In order to design effective assessments towards this goal, I engaged initially in reading various sources about the uses of formative and summative assessments in order to have a foundation of understanding. I began with Common Formative Assessments: How to Connect Standards-Based Instruction and Assessment by Larry Ainsworth and Donald Viegut. In this book, Ainsworth and Viegut offered the view that "classroom formative assessments" are typically not used to assign grades, but as "assessments for learning," which one could analyze the results solely to inform instruction. This made much more sense to me, and was a relief. Also, I came to understand the value of giving a pre and post assessment that contained the same questions, and with the help of my district mathematics specialist, created one to be used in the pre and post phase of instruction.

Ainsworth and Viegut also described additional forms of common formative assessments, such as performance assessments. The authors highlighted the need for performance assessments that actively required the student to create a product or construct a response, which would be highly engaging and open-ended. Likewise, Ainsworth and Viegut recommended the use of planned accelerations to accommodate capable students "going above and beyond." Lastly, Ainsworth and Viegut emphasized that ongoing assessments can lead to effective teaching methods of differentiated strategies that provide interventions and acceleration that meet individual students' needs. Readings published by The National Council of Teachers of Mathematics in *Mathematics Assessment: Myths, Models, Good Questions, and Practical Suggestions*, edited by Jean Kerr Stenmark, further strengthened the view that ongoing instruction was the best preparation for assessment, and similarly that for teachers, ongoing assessment was the best foundation for instruction.

In addition to the various professional texts I read, I collaborated with the district mathematics specialist to find resources and materials to differentiate instruction based on my assessments. With her assistance, I created a comprehensive pre-assessment that would also serve as my post-assessment. This was beneficial because the assessment first evaluated equivalent fractions as a basis for additional questions which used an underlying concept of addition and subtraction of fractions with unlike denominators. The assessment was well-constructed because questions 4-6 contained pictorial representations and questions 7-10 did not. A shift in design such as this meant that different learning styles were accommodated while there was a progression of pictorial versus abstract representations of fractions. Further insights came from articles suggested by the district

math consultant, such as the NCTM magazine Teaching Children Mathematics. From this ample resource, I gleaned ideas about activities that gave a more hands-on, physical approach for instruction, such as having students jump on number lines taped to the classroom floor or asking students to solve real life problems as accelerated fraction work. This resource also assisted me in finding multiple manipulatives, such as fraction strips, magnetic fractional pizzas, and most importantly, pattern blocks, both paper and wooden.

The pre-assessment given at the beginning of this module helped me to target my instruction and focused my teaching to the grade-level expectations. Evidence provided by this assessment showed me that only 4 percent of the 22 students taking the pre-assessment scored at or above the proficient range. More importantly, 78 percent of the class scored at the below basic range of 59 percent or lower on the pre-assessment. Based on the data from the pre-assessment, I found it necessary to instruct the whole class in all of the assessed areas. As I instructed my students and observed their performance, I gave periodic probes to further plan for differentiating task-oriented flexible groups. I conducted the module cycle as an initial probe that informed the creation of groupings, followed by two additional probes as follow-ups to ascertain student mastery of the skill and concept before moving on to the next one. If students did not master it, I conducted additional small group work in the morning or one-on-one interventions to assist the student toward mastery.

Several interesting things occurred during the scaffolded instruction. In two lessons in which students were asked to use pattern blocks to represent fractions equal to one whole, students wrote about their designs using algebraic terms, which in turn led to a fraction number sentence that had to be solved. I observed that many students were not familiar with algebraic terms. Also, after grading the second set of formative assessments, only a small handful of students (six of 23) fully grasped all of the concepts. This was interesting to note because most of these were students that generally have a strong understanding of numerical and proportional reasoning skills and concepts. Furthermore, two of the students that struggled regularly benefitted from the hands-on use of the pattern blocks and participation in trades of blocks. Based on my assessment, I concluded that many students could not find equivalent fractions without a pictorial representation and needed to move and trade manipulatives as a critical factor for initial fraction work.

Since results from my assessments showed that about three-fourths of the class had widely ranging misconceptions, I decided to alter my teaching strategies. I moved several students onto an additional activity/game to reinforce the concepts that they already mastered. I also re-taught several concepts of adding fractions with unlike denominators and re-taught how to write about them. I instructed most of the class in this way using SMART Board technology, and divided students into working groups after that. Students who mastered the skills worked on enrichment activities involving fraction concepts, independently and as partners.

The initial differentiated lessons with multiple groupings were difficult to manage, especially when some students within the re-taught grouping finished quickly while their peers struggled. Even when

assisted by a teacher's aide, it was challenging to work with the students who struggled, or required additional reinforcement, or needed further forms of engagement, while I worked with other subsets of students. At that point, after grading other formative assessments, coupled with observations made in my journal, I was again left with two groups, some of whom understood the concepts, and some who did not. I decided to use a small strategy group focused on writing about the problems using the algebraic and fraction representations. Based on the probes and observations, I recognized two students who required more intensive one-on-one instruction.

As I taught successive lessons, it was interesting to use probes as a means to understand student learning or the lack of it. I noticed that several students who consistently do well in math and have a strong number sense would not initially use the strategies offered to get the correct answer. I might not have known this without using ongoing probes. Likewise, the probes demonstrated that activities related to real life problem solving were beneficial for those students that achieved mastery, as evidenced by their consistent independent work, enthusiasm, and level of engagement. I observed that they sought successive situations in which to apply their knowledge of adding and subtracting fractions. For example, students were asked to create a stained glass window that consisted of initially 24 triangles arranged in a hexagon and then a 96-triangle hexagon. Students had to use four different pattern blocks and four different colors to complete the symmetrical design. Then, students had to add the fractions of each pattern block by color, using trades to get it to equal to one whole

Overall, the use of varied, ongoing formative assessments led to a lesson-by-lesson approach, which in turn led to an evaluation of student progress that identified specific follow up intervention strategies and/or support or enrichment. Differentiation of the lesson material following the probes is the main reason that I feel there was such dramatic improvement in the overall scores between the pre and post-assessments. As I mentioned earlier, the pre-assessment showed that only 4 percent of my class of 22 students scored proficient or higher, which is a dramatic difference from the post-assessment in which 64 percent of the same 22 students scored proficient or better. What is even more striking is the fact that on the post-assessment, the average percentage was 71, which is in the proficient range, while on the pre-assessment the average percentage was 23, which is in the below basic range. I attribute student growth, by-and-large, to the continuous collection of data provided to me by the various formative assessments and observations. This module increased my awareness that although the achievement of my students is critical, individual student struggles with organizational and behavioral skills impacts the acceptance and inclusion of new strategies and understandings of concepts. I noticed this often throughout the process as several students exhibited anxiety about taking the assessments. I observed that many students would do fine with small group work, but would not apply the same strategies independently. It was important that the students came to see the assessments as an integral part of the lessons. Moreover, they appeared to worry less about their use, and saw the formative assessments as a bridge to further assistance, a demonstration of what they learned, or as an invitation to further enrichment.

As I reflect on my work during the module, I drew several conclusions about the usefulness of assessments for teaching and learning. First, my understanding of their use deepened as they became the basis for all my lesson probes. Each probe aligned with a specific skill from the pre-assessment. Moreover, these aligned probes guided the next lesson's flexible groupings, which allowed me to differentiate my instruction based on students needs as demonstrated by their ongoing performance. This instruction allowed students to express their learning through different tasks ranging from teaching of pre-requisite skills, such as equivalent fractions through hands-on applications with manipulatives to real-life problem solving.

Secondly, with the exception of the post-assessment, my use of assessments in general shifted from summative to formative assessments; constructed so that students demonstrated their learning in different ways ranging from pictorial representations of adding and subtracting fractions with unlike denominators to abstractions to find the answer.

Thirdly, the completion of this module led me to more consistently and concretely understand the achievements and struggles of my students related to their study of fractions. For example, I have a 13 probe, fraction "creature" assessment, a pre and post-assessment, and many individual probes. Also, the use of spreadsheets to collect and analyze the data aided my examination of emerging trends and patterns that informed my ongoing and future instruction.

Regular reflection about the process of student learning assessments afforded me the opportunity for insight into non-academic factors such as organizational, behavioral, and social/emotional skills. I also realized that the use of assessments must guide my instruction, be aligned with the learning objectives, and created in such a way that allows for students to demonstrate the ways in which they learn best. No longer will I consider the summative assessment as the most important unit assessment, but will look at the collective evidence of my observations and formative assessments to drive differentiated instruction.