TEAM

What Makes This TEAM Reflection Paper Successful?

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

Module Four: Assessment Grade: 7 Subject: Science

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

How the teacher developed new learning:

- Attended a workshop on Excel
- Read *Checking for Understanding Formative Assessment Techniques for Your Classroom* by Fisher and Frey
- Analyzed student assessment data

What the teacher learned:

- "I learned that I could set up filters [in Excel] so that I would be able to look at specific categories and see which students were having trouble with different parts of the scientific method."
- "I learned that assessment of student understanding should come from collecting evidence over time instead of one single assessment at the end of the unit."
- "From my reading I also realized the importance of monitoring all students' understanding throughout the class period, and I learned how to use partner talk and hand signals (i.e. thumbs up, sideways, or down) as formative assessments."

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

- "Based on the data from the first benchmark, I decided that it would be best to focus on the problem, hypothesis and variables first, rather than attempting to teach all the parts of the scientific method at once. I designed numerous lessons on these concepts and used flexible groups for my students in order to meet their different levels of understanding."
- "I used this data to plan an additional lesson on hypothesis writing and variable identification … I focused on key words that students could use to help them identify variables. I also created a type of written formula that students could use to make sure that they had their hypothesis written in the correct format."
- "I used hand signals as I explained all the different parts of a good scientific conclusion. I asked for hand signals (thumbs up, sideways, or down) periodically during my lesson, and it allowed me to stop and go back when needed so that I could get all students with a thumbs up."

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

- On the first benchmark "59% of students were correct or partially correct in identifying the problem. 2% of students were correct or partially correct in constructing a hypothesis. 8% of students were correct in identifying the independent and dependent variables" … On the second benchmark "74% of students were correct or partially correct in identifying the problem. 70% of students wrote a correct or partially correct hypothesis. 60% of students were correct or partially correct in identifying the independent and dependent variables."
- When I asked students to reflect on how they liked the thumbs up/down check- in, one student wrote, "I liked that you were checking in to make sure we knew what to do." Another student said, "When I saw other kids with their thumbs down or to the side I felt better that I wasn't the only one who didn't totally get it." A third student wrote, "I was glad you didn't just keep going when I was confused."

Indicator: 2. Teachers use multiple measures to analyze student performance and to inform subsequent planning and instruction by: Uses a comprehensive set of data that provides depth and breadth of understanding of student achievement at a particular point in time and over time.

Goal:

I will use benchmark assessments to collect a comprehensive set of data corresponding to students' understanding of the scientific method. I will analyze this data and use it to drive subsequent planning and instruction so lessons will be focused on areas of difficulty. I expect to see an improvement in the students' application of the scientific method over time.

Initial Summary:

My assessments are usually comprised of some knowledge based questions, some skill based questions, and the application of concepts that we have been working on during science class. When I give an assessment, I usually record the grades and take an overall look at which students had the most problems, and where those problems were focused. I don't feel that I have collected comprehensive data well enough to modify my own instruction within one unit, in order to improve the understanding of certain concepts for my students. I have not collected data sets in order to compare progress of students over time. I currently use their overall grade as a measure of progress instead of identifying specific problem areas within a smaller unit.

Reflection Paper:

As I began this module, my mentor and I used the CCT Performance Profile to try to target an area of my teaching that I felt needed improvement. I decided that I wanted to concentrate on learning how to better use data that I collect from assessments given in my classroom. I realized that I have not been critically analyzing or using the data to help improve student performance. So, I created a goal to better use data to monitor student progress and inform future lesson planning.

My first step in progressing toward my goal was to decide on a benchmark to use. The benchmark that I chose is centered around the understanding and application of the scientific method. This is a concept that students will use throughout their science career in school. Since it is so important, I want my students to be able to successfully apply the scientific method to different investigations. The benchmark assessment consisted of a scientific scenario that the students had to read. After reading, students had to identify the problem that the experiment would answer, make a hypothesis, and identify the variables in the scientific investigation. Students then used data that was provided to them to make an appropriate graph to display the data and then they analyzed the data for the scientific investigation in order to write an appropriate conclusion. I gave three benchmark assessments during the course of this module. The first one was given before I

began the unit on the scientific method. The second benchmark assessment was given near the end of the unit. The third was given in the middle of the following unit on cells, since the scientific method is a concept we work on all year.

I used a thirty point rubric to grade the benchmark assessments. I looked for the correct identification of the scientific problem. I checked for correct wording of the hypothesis and identification of the independent, dependent and constant variables. Graphs were graded on six points: correct type of graph, title, axes labels, key, neatness, and whether or not the graph appropriately fit the graph paper. I assessed for specific parts of the conclusion. I was looking to see that students restated their hypothesis and said whether it was supported or rejected. I looked to see that they used data to support their statements. They needed to give two sources of error, give improvements that could be made to the experiment, explain what they learned, and give new testable questions the experiment made them want to investigate.

After giving the first benchmark, I had a lot of data, but needed an organized way to compile and analyze it. I needed to start by becoming more proficient with the Excel program. I set up an Excel file with the names of my students. I then attended a workshop on the Excel program. During the workshop, I learned how to put all the different categories that I had graded my students on during the benchmark assessment into the file with my student names. I learned that I could set up filters so that I would be able to look at specific categories and see which students were having trouble with different parts of the scientific method. For example, the filters can be set so that I can see a list of students who are not able to correctly write a hypothesis, or they can be set so that I can see which students are able to write the problem, but not identify the variables. This really helped with my data analysis because it enabled me to see the categories that the majority of my students were struggling with, and then I made adjustments to my instruction to help them improve in those areas. During the Excel workshop, I also learned how to make graphs to display the data that I was collecting. Learning how to manipulate the data to better analyze it was important to accomplishing my goal.

The first benchmark was used as a pre-assessment. I found that 59% of students were correct or partially correct in identifying the problem. 2% of students were correct or partially correct in constructing a hypothesis. 8% of students were correct in identifying the independent and dependent variables. Because I have 99 students, I have decided that in order to demonstrate the specific growth that I have seen, I will focus on three of my students for parts of my reflection paper. Student A is a student who struggles with the application of many concepts that are discussed in class. Student B is an average student with the ability to focus and work hard, but does not do this consistently. Student C is a high performing student that participates in class, asks questions, and engages in classroom discussions.

On the first assessment, Student A scored 5 points out of 30, Student B scored 4 points out of 30, and Student C scored 11 points out of 30. Student A had the problem partially correct, but was

unable to write a hypothesis or identify the variables. Student B was unable to identify the problem, write the hypothesis correctly, or identify the variables. Student C was partially correct in identifying the problem, could not properly write a hypothesis, but did identify both the independent and dependent variables.

Based on the data from the first benchmark, I decided that it would be best to focus on the problem, hypothesis and variables first, rather than attempting to teach all the parts of the scientific method at once. I designed numerous lessons on these concepts and used flexible groups for my students in order to meet their different levels of understanding. I used whole group instruction for some lessons. For others, students worked in small groups so that I could circulate throughout the room to better assess their progress. During this time, I was able to work individually with students who were having a hard time identifying the variables in the scenarios that I gave them to work on. When I felt that the students had a better understanding of these three concepts, I used a quiz as a formative assessment before my second benchmark. Since my goal was focused on data, I was very careful when I looked at the results I gathered from the small, formative assessment. I realized students were still having a great deal of difficulty with identifying variables and writing a hypothesis. I used this data to plan an additional lesson on hypothesis writing and variable identification, even though I had been planning to move on to the next portion of the scientific method. In my subsequent lesson, I focused on key words that students could use to help them identify variables. I also created a type of written formula that students could use to make sure that they had their hypothesis written in the correct format.

After working on the beginning portions of the scientific method, as well as graphing skills, I administered the second benchmark. First, I looked at the total score of my students. Student A scored 11 points out of 30. Student B scored 13 points out of 30, and Student C scored 17 points out of 30. I was pleased that my students had made overall progress. Although Student A demonstrated improvement, when I looked specifically at the problem, hypothesis and variables, I found that he was not able to correctly identify the problem on this benchmark. However, he was able to write a hypothesis that was partially correct, and also correctly identified the independent variable. Student B did not make progress in identifying the problem, but was able to write a hypothesis that was partially correct, and correctly identify the dependent variable. Student C was able to write the problem, hypothesis, and identify the dependent variable. Student C was not able to identify the independent variable.

When I looked at the results of the second benchmark for all my students, I found that 74% of students were correct or partially correct in identifying the problem. 70% of students wrote a correct or partially correct hypothesis. 65% of students were correct or partially correct in identifying the independent and dependent variables.

From these results, I realized that the analysis I had completed after the first benchmark may have helped increase the success of my students. Instead of just filing the data away, I took the

information and used it to target weak areas that I had seen in the majority of my students. By focusing lessons on those specific areas, I was able to raise the achievement of a number of my students. Because of the success I saw by using the data to monitor my teaching, I decided to see if I could learn about new ways to check for understanding that I could use during lessons, in addition to using the collected data to drive my instruction.

The data analysis that I had conducted on my first two benchmarks led me to thinking about different types of assessments I could use in between the larger benchmark assessments. If I could use informal data collected during class from different types of assessments, I thought that I may see a more dramatic increase in student achievement on my next benchmark assessment. I decided to read and apply some strategies from *Checking for Understanding: Formative Assessment Techniques for Your Classroom* by Fisher and Frey. I learned that assessment of student understanding should come from collecting evidence over time instead of one single assessment at the end of the unit. I felt that this belief fell in line with my goal of collecting and analyzing data over time to monitor student progress and adjust instruction.

From my reading I also realized the importance of monitoring all students' understanding throughout the class period, and I learned how to use partner talk and hand signals (i.e. thumbs up, sideways, or down) as formative assessments. Partner talk allows students to discuss some topic or concept and question one another to come to a deeper understanding of that topic. I found this type of formative assessment useful because it allowed me to circulate throughout the classroom and listen to student conversations. It was a way that I could clear up misunderstandings that I overheard students discussing. It also gave me a way to gauge the overall understanding of the concept we had been discussing.

During the unit on cells, students were learning new content, while still working to improve their understanding and application of the scientific method. I spent quite a bit of time working on the beginning portions of the scientific method and on graphing, but needed students to begin to improve their conclusions. So, as I explained all the different parts of a good scientific conclusion, I asked for hand signals (thumbs up, sideways, or down) periodically during my lesson, and it allowed me to stop and go back when needed so that I could eventually get all students with a thumbs up. I found that it was helpful to me, and the students liked it. I got a lot of positive, nonverbal responses from students when they went from thumbs down to thumbs up. When I asked students to reflect on how they liked the thumbs up/down check- in, one student wrote, "I liked that you were checking in to make sure we knew what to do." Another student said, "When I saw other kids with their thumbs down or to the side I felt better that I wasn't the only one who didn't totally get it." A third student wrote, "I was glad you didn't just keep going when I was confused." Collecting that type of informal data was a way for me to reach more of my students and allowed me to monitor everyone in the room all at once.

During the third benchmark, I was hoping to see a continued improvement on the problem, hypothesis and variables, but was expecting a drastic improvement on the conclusions that students made. On the first benchmark, 0% of students had restated their hypothesis in their conclusion, although 94% had partially restated the hypothesis. 0% of students supported their statements with data, and students did not include any other points in their conclusions. On the second benchmark, 49% of students had restated their hypothesis, 15% had supported their statements with data, and less than 5% of students included any other portions of the conclusion. On the third benchmark, 85% of students restated their hypothesis, 70% used data to support their statements, 57% gave sources of error, 23% said what they learned, 54% gave ways to improve the experiment, and 40% listed some new testable questions to investigate (graphic analysis is attached). I was extremely happy with the results that I saw.

I then looked specifically at students A, B, and C. During Benchmark 1, Student A scored 2 out of 12 points on their conclusion and Students B and C scored 1 out of 12 points. On the third benchmark, Student A scored 4 out of 12 points; Student B scored 6 out of 12 and Student C scored 11 out of 12 points. (The overall progress of these three students can be seen in a graph attached to this reflection paper.) After the third benchmark, I held individual conferences with students to show them the progress that they had made, and to let them know what they should continue to focus on. Before this module, students may not have been getting enough feedback from me after an assessment, since I was recording grades, but not analyzing the data. I will continue to conference with students periodically to discuss their progress and give them specific suggestions on how they can improve their performance (Indicator 4).

At the end of this module, I felt that I had definitely improved my use of data. Instead of putting scores immediately into the past, I had found a way to organize and analyze them. The filters that I set up in my large data set helped me to target those students who were struggling in a particular area. It was a way to give myself small lists of students to make sure that I worked with them on their trouble areas. In the future, I would like to use the filter settings I created in Excel to put together small groups of students. I could either group students with the same weaknesses together so that I could do some small group instruction, or I could pair two higher performing students with two lower performing students and have them work on that concept together. My data analysis helped me to plan my instruction around the areas that were real weaknesses for my students. That benefited my students because I could spend less time on things they already knew, and more time on things that they were struggling with, and in the end, I saw an improvement in their scores.