



EDUCATIONAL
SERVICE
DISTRICT 112



THE SUSTAINABLE CLASSROOM PROJECT

Elementary Case Study: Kelly

Project designed and developed by the
ESD 112 Educational Technology Support Center
Debbie Tschirgi, Director
2500 NE 65th Avenue
Vancouver, WA 98661
Phone 360.750.7505

Research design developed, conducted and
reported by MLaCounte Services
Dr. Marlene LaCounte, Principal Investigator
6134 SE Sigrid Street
Hillsboro, OR 97123
Phone 503.577.2263



<http://edtech.esd112.org>

About Kelly

Kelly has been teaching at the primary school level for 29 years. She earned her Bachelor's Degree from Western Washington University and received her Master's Degree in Education from Portland State University. For as long as she can remember, she has wanted to be a teacher. While attending school, Kelly did a lot of volunteer work in elementary schools and with the Head Start program. She began working at a local high school after getting her teaching certificate, but decided that she would rather teach at the elementary level. She taught first grade for fourteen years before being transferred to another school to teach second grade. At her small school, Kelly has mainly been the second grade teacher but has also taught third grade and a second/third grade blend. In addition to her teaching responsibilities, Kelly is the building technology coordinator and is often the principal designee.

The school district in which Kelly teaches is located in a small city of about 12,000 people off Interstate 5 at the confluence of two tributaries with the Columbia River in southwest Washington. The city was founded in the 1840s by a surveyor who named the town after his Scottish home and has the distinction of being known as the "Smelt Capital of the World." The school district is made up of two high schools, two middle schools, and seven elementary schools. The total enrollment for the 2004-2005 school year was 5,205 with a white, non-Hispanic population of 70.7% and a Hispanic population of 12.9%. The school district was ranked 50th among Washington's 100 largest school districts.

Kelly has used technology in teaching since 1996 when her classroom became a TELDEC classroom (Technology and the Essential Learnings: Developing Effective Classrooms). Since that time she had taken an INTEL training course, become a TTEL (Technology Training for Emergent Learners) trainer and most recently attended a conference on Remote Sensing Education that focused on using GPS and GIS in the classroom. Within the school district, she serves as a member of the Technology Committee and the Technology Research Committee that is working on writing technology lessons using *Classrooms Instruction That Works* (Marzano, Pickering and Pollock, ASCD, 2001) as a guide.

Before her involvement in the Sustainable Classroom Project, Kelly's classroom technology included an Elmo document camera, a projector and, later, six new computers and various software programs. She used the technology to enhance learning in a variety of ways including presenting interactive lessons in which students wrote over projections on the whiteboard, showing United Streaming videos and webcam sites from her teaching station, and utilizing the computers to engage students in research projects using HyperStudio, KidPix, and numerous programs for making maps and graphs.

Kelly's Classroom



Introduction

Kelly applied for the Sustainable Classroom Project because she wanted to be “actively involved in bringing a higher level of technology into [her] classroom” in order to get the students more engaged in their own learning experiences. She said, “I am most excited about the endless possibilities for helping my students meet the standards through research projects and problem-solving using technology-rich activities.”

This year Kelly’s classroom consists of twenty-one second grade students who are predominantly of white/non-Hispanic ethnicity (19 of 21). Students in her class generally come from middle-income families where one or both parents work outside the home. She has three volunteer parents who come into her classroom once or twice per week. Her classroom is evenly split between boys (48%) and girls (52%). The students are of mixed academic levels. Kelly wrote, “I have eleven students who are reading above grade level, six reading at grade level, and four reading below grade level.”

The Book Study

CHAPTER 1: BEGINNING THE STUDY

Kelly embarked upon the Sustainable Classroom Project with mixed emotions. She was worried about the immediate issue of technology support, excited about the promising effects the technology could have on student learning, and contemplating the future. “I am a bit concerned,” she wrote in her first journal, “about keeping up with the lessons since I feel at this time all the technology isn’t up and running like I’d like it to be. I know [my principal] will put some pressure on the district to get things moving so I suppose I shouldn’t be worried.” She continued:

I am excited about the possibilities of the technology because I have already seen how engaged my students become when we use the interactive whiteboard and the [wireless response system]. During the demonstration lesson I did for [my principal] and the school board member, every hand went up when I asked for a volunteer. The expressions on the faces of my students reminded me of the expressions on the faces of the children in the ad for a whiteboard in the “Instructor” magazine. Parents and teachers are also anxious to see what I have in my classroom. During Back to School Night, I was doing very short demos for parents and students because my students already had been talking about the new technology. I wonder whether or not the excitement will last?

INSTRUCTIONAL STRATEGY 1: SIMILARITIES AND DIFFERENCE

Unit Topic: Social Studies – Schools Past and Present
Technology Used: Interactive whiteboard

As the second week of the Project began, Kelly read and reacted to *Chapter 2: Similarities and Differences*. She was familiar with most of the techniques discussed, but noted some variations that were interesting. She chronicled:

The second chapter in Marzano’s book discussed the strategy of identifying similarities and differences. I know we have used this strategy throughout our building as a way to encourage students to use higher level thinking skills while helping them understand information.

I did find it quite interesting to see that when presenting either a teacher can direct the comparison task or students can select the characteristics to be compared. I suppose we tend to use the first approach more often since we have specific information we need to present.

Another bit of information I would like to try would be to use the Venn diagram with only one characteristic at a time. I wonder whether or not it will make a difference having students see each characteristic in isolation. It is something that I really hadn't considered doing before.

The goal for Kelly's experimental lesson was for her second grade students to actively participate in completing Venn diagrams to show similarities and differences between schools, past and present. The lesson called for use of the interactive whiteboard, Venn diagrams, the document camera, Scholastic Keys, Kidspiration, PowerPoint, student computers, a projector, and the social studies textbook. Kelly planned to introduce the concept of Venn diagrams and supervise students as they worked independently on them. The students would observe her demonstration and, after completing work on their Venn diagrams, they would work in small groups developing PowerPoint presentations. To assess student work, Kelly would check the students' Venn diagrams and the students would show their PowerPoint presentations to her and the class.

The lesson was scheduled to be taught on Thursday; however, the school had to be evacuated for two days because of an electrical problem caused by a torrential rainstorm. Kelly had invited the external observer in for Thursday, so the visit was postponed.

Kelly wrote the following assessment in her journal:

I went ahead and taught the lesson using similarities and differences on Wednesday because we didn't have school on Thursday or Friday. We began with a general topic and talked about what students and teachers use in a classroom. The students helped create the Venn diagram by dragging and dropping pictures. Students worked in small groups on Venn diagrams, but I had each group work on specific attributes. I did feel students had to think a bit harder in order to come up with the three required items per section so perhaps individual attributes is a better way to teach similarities and differences using the Venn. However, when we finish the presentations, I will let the students combine attributes.

In using the wireless response system to evaluate the lesson:

- ◆ 68% of the students in Kelly's class voted that they absolutely or mostly understood the lesson ideas;
- ◆ all of the students (100%) indicated that the instructional strategy absolutely or mostly helped them understand the ideas;
- ◆ 88% thought the technology absolutely or mostly helped them understand the lesson ideas; and
- ◆ 88% liked the way they learned the lesson.

INSTRUCTIONAL STRATEGY 2: SUMMARIZING AND NOTE TAKING

Unit Topic: Mathematics – Story Problems

Technology Used: Interactive whiteboard, document camera

Kelly was completely familiar with the instructional strategies used in *Chapter 3: Summarizing and Note Taking*. However, she was eager to have the students learn and practice summarizing and note-taking techniques using the equipment provided through the project. She wrote in her journal:

The chapter I just read was about summarizing and note taking. I know we do a lot with summarizing so this was not something that was new to me. What I am excited about is the fact that now I'll be able to use the highlighter with the document camera to show students by example. Students will also get a chance to come up and highlight important sections of the text. I think it will make the discussions more focused and meaningful.

The second part of the chapter discussed note taking. I remember back to my TELDEC days when I tried to show webbing to my students using one computer and a poor quality Avery (?) device. It was difficult to see although the students enjoyed the activity. Sometimes it was easier to complete the Inspiration activity in small groups huddled around one computer. Ah... "the good old days." I'm very pleased that technology has improved to the point where all students can be presented with a webbing model at the same time.

I think showing the note card technique we use for reports will also be easier using the document camera. When students can help complete the model cards, I think they will better understand what they will be expected to do.

Kelly developed the experimental lesson for the chapter for mathematics story problems. Her goal was that her students would be able to determine if a story problem was addition or subtraction. She also wanted them to be able to use a math terms chart and complete a story problem chart. The instructional materials used in the lesson were the math chart, the interactive whiteboard, ADD story problems, the document camera, and software for the interactive whiteboard. Kelly led the discussion about story problems and her students' highlighted important information in story problems on the interactive whiteboard. She would assess her student's learning by having them independently complete a story problem chart.

Kelly was stimulated by the lesson outcomes. She wrote in her second journal:

Wow! I just finished teaching a math note taking lesson and got great results. Students were engaged with the activity since it was done with the highlighters, drawing tools and pencils. Everyone wanted to complete the entire activity, but for the lesson, I just had to call on students so all would get a chance to come to the whiteboard.

My plan is have one student do the note taking and another one will complete the chart using the information. Students were able to complete their own charts fairly easily after we had done several practice problems. Usually, we spend several days trying to get students to catch onto the idea of looking for important, useful information in their story problems. Then there is the entire next step of being able to justify their work along with drawing a representation of the equation.

I am so amazed at the high level of excitement and involvement with activities done with [the interactive whiteboard software]. My students certainly love all the new technology.

We will be trying several other note taking activities in the near future because having them see what's important in a paragraph and having them come up and highlight the information helps them when they try the task on their own.

I am looking forward to trying the note taking in reading using some of the suggestions in the book.

In evaluating the lesson using the wireless response system:

- ◆ 100% of Kelly's students indicated that they absolutely or mostly understood the ideas in the lesson;
- ◆ 100% said that the strategy used in the lesson helped them to understand the lesson ideas;
- ◆ All of the students (100%) said they believed the technology absolutely or mostly helped them understand the lesson ideas; and
- ◆ Student responses for Question 4 (I like how we learned this lesson) did not save.

INSTRUCTIONAL STRATEGY 3: REINFORCING EFFORT AND PROVIDING RECOGNITION

Unit Topic: Spelling Practice

Technology Used: Interactive whiteboard, document camera, wireless response system

For the most part, Kelly indicated in Journal 1 for the chapter, that she was familiar with the strategies discussed in *Chapter 4: Reinforcing Effort and Providing Recognition*. As she thought it through, she devised a tentative lesson plan:

The chapter we worked on was recognition and reinforcing effort which I thought would be an easy task. However, I am finding that one never can assume anything. There were many things I found I was already doing like the discussion of how effort affects success, making the rewards meaningful, and the “I think I can” attitude. There was a strategy that I did not recognize and that was “pause, prompt, and praise.” I am curious to see how this will work at second grade.

Since we are working on graphs, I think it will be interesting to see how my students respond to graphing their effort in spelling. I am hoping it will help them realize that the more they work at home, the easier their work will be at school. We’re beginning with spelling since we start out with a brief practice on Monday before a practice test and end on Friday with the final test. This week I have added a challenge list for those students who could spell all the regular list words correctly on the second practice test. I did tell them that learning the challenge words will take extra practice. I guess the graph/voting will help us determine how successful they are.

Kelly’s goal for the lesson was that her students would understand that the more time they spend learning spelling words, the easier the tests will be. Students were given two lists of spelling words at the beginning of the week – the regular words and the challenge list for those students who could already spell all of the regular words. The students were asked to study at school and at home every day during the week. Kelly gave practice spelling tests each day until the Friday test and at school students would write the spelling words on the interactive whiteboard chart, then check their spelling. Each day, the students used the wireless response system to indicate how much time they spent studying for spelling. Students would look at the graphs of time spent studying and the number correct on practice tests. Kelly provided recognition for students who had increased their study time and their number of correct spellings. On Thursday, a pretest was given and if students earned 100% on the spelling pretest, they got a certificate and didn’t have to take the Friday test.

The external evaluator was invited to visit the class on Thursday during spelling. She wrote the following observation.

Observation #1:

Kelly started the lesson by showing a Spelling Homework chart on the document camera. Students were asked to mark on their personal charts how much effort they had put in on spelling homework the night before. She then handed out paper for a practice spelling test and proceeded to read spelling words while students wrote them on their papers.

When the test was completed, students were asked to correct their own papers. The words were hidden on the interactive whiteboard with colored markers and students volunteered to take turns removing the markers from the word and checking their own spelling. Kelly praised those students who were correcting their spelling papers in a timely manner. When the list was complete, students counted the number of words they had missed, then wrote the number wrong at the top of their paper.

Students were instructed to take out their wireless response units and respond to questions about the amount of time they spent studying spelling the day before. Kelly showed graphs of the two previous days with the amount of time spent studying and asked students to evaluate if studying spelling homework helped them spell more words correctly. Students used their wireless response units to indicate the number of words they misspelled. Kelly asked the students if they thought she

could tell how hard they had studied by looking at the number of words they missed on their spelling test. Students voted. Kelly showed a graph of their responses and asked students to generalize. The students were very excited about seeing the relationship between effort and achievement.

In her assessment of the lesson, Kelly wrote:

[The students] certainly seem to respond well to working with the whiteboard, and they all did better on their spelling tests than I would have expected. Having them graph their efforts showed them that the amount of time spent on a task relates to how well they perform. Since this was the first week I gave a challenge spelling list, I knew students that were working on the Challenge List would have to work hard in order to know their words by Friday. I was pleasantly surprised when all but three students did not pass the spelling test on Thursday. The three only missed one or two words so when they took the test on Friday, they did well.

We took a few minutes to examine the effort graphs today and made some comparisons about effort and performance on the tests. Most of my students were able to see that the amount of time spent helped them do well on their spelling tests. Many of them wanted to continue to graph spelling effort this week. I suggested that we graph effort on math, too. It's really a wonderful way to cover graphs while helping students improve effort put forth on assignments. As for the pause, prompt, and praise strategy, I tried using it with one of my students who consistently has a difficult time staying on task. She responded well to taking a moment to stop working in order to take a look at the task. With prompting she started working and completed her DOL on time. Of course, she liked the praise piece as always.

Student evaluation of the lesson indicated:

- ◆ 95% absolutely or mostly understood the key lesson ideas;
- ◆ 95% believed the strategy absolutely or mostly helped them understand the ideas;
- ◆ 100% believed the technology absolutely or mostly helped them understand the lesson ideas; and
- ◆ 95% absolutely or mostly liked how they learned the lesson.

INSTRUCTIONAL STRATEGY 4: HOMEWORK AND PRACTICE

Unit Topic: Mathematics – Math Timings

Technology Used: Interactive whiteboard, document camera

Kelly saw a strong relationship between *Chapter 5: Homework and Practice* and the topic of effort in the previous chapter. She particularly noted that what was happening in her classroom was consistent with the research.

I think most of us feel the pressure to involve parents in helping our students extend their learning beyond the regular school day. There seems to be so much to cover that giving students time to practice what has been presented at school is important. At the lower levels, most of the practice should be with reading and math since most parents are able to support that kind of practice. I think they are also able to make sure our students understand the purpose of the practice.

The lesson Kelly planned for the homework strategy was designed to encourage her students to practice math flash cards at home to improve their math timings. She wanted her students to know addition and subtraction facts to 18. Math flashcards, a homework sheet to provide practice, timing sheets, student graphs, the document camera and the interactive whiteboard were used for instructional materials. The students were assigned to practice flashcards and have their parents verify their practice. Kelly checked their homework sheets and passed out timing pages that students would complete in the given amount of time. Then, Kelly helped the students record on their graphs the number of problems they completed. The students shared their graphs with others using the document camera.

Kelly analyzed the lesson:

I have just finished teaching my lesson on homework and practice. As usual, I was very surprised to see how well my students responded to the idea of graphing the progress on their math timings. For the most part, my students realized that the practice at home made the work at school much easier for them to complete. I will continue to use the graphing idea with math and would like to add it to reading. We are still using the spelling graph for effort which is working well.

The homework at second grade is rather simple but important since beginning readers need as much practice as they can get. Homework is also important for practicing math concepts that have been introduced. Since we have such supportive parents who do not mind helping set guidelines for homework, the job of sending homework becomes much easier. As an example, I had 100% of my students return their reading homework this week. I'm hoping the graphs have made a difference in how they view their homework assignments.

With the technology that I now have in my classroom, viewing the graphs was helpful for discussions. The students of course loved coming up to share their graphs and talk about them. With each lesson, I continue to be amazed at the enthusiasm my students show when they know they get to use the interactive whiteboard and response units.

Student evaluation of the lesson indicated that:

- ◆ 81% absolutely or mostly understood the lesson ideas;
- ◆ 76% believed the instructional strategy absolutely or mostly helped them understand the ideas;
- ◆ 90% thought the technology absolutely or mostly helped them understand the lesson ideas; and
- ◆ 95% absolutely or mostly liked how they learned the lesson.

INSTRUCTIONAL STRATEGY 5: NONLINGUISTIC REPRESENTATIONS

Unit Topic: Science – Butterflies

Technology Used: Interactive whiteboard, document camera, wireless response system

Kelly was comfortable and in tune with the ideas presented in *Chapter 6: Nonlinguistic Representations*. She already incorporated many nonlinguistic techniques in her classroom. She wrote:

Our assignment this week was to read about linguistic and nonlinguistic strategies. I believe I use both about equally since my second graders are very willing to participate. However, I think they respond better to the nonlinguistic strategies since there is some freedom of choice and expression. I often think we do not give our students enough opportunities to be somewhat creative in their learning after the primary grades because of the amount of information that must be covered. There does not seem to be as much time for students to participate in the nonlinguistic instructional strategy. I do however believe that teachers who can creatively present the nonlinguistic strategy in lessons will have a higher level of understanding by their students.

She emphasized her agreement with the strategy by revealing:

I love seeing what my students create when they illustrate what we are learning. We have done this on a regular basis in math, reading and writing. Building a model lends itself well to our science units...

The lesson Kelly planned for the nonlinguistic instructional strategy was for her science unit on butterflies. Her goal was that students would learn the four stages of the life cycle of the butterfly and would be able to label them on a life cycle stages chart. Kelly used the document camera to share a book on butterflies and the interactive whiteboard to discuss the life cycles and look at the diagrams. Her students practiced labeling the stages of the life cycle of the

butterfly using the interactive whiteboard. Then, they created models of the life cycle using craft supplies and paper plates. Kelly graded the students' models for accuracy.

After the lesson, Kelly reflected in her journal:

Teaching this lesson was fun since the students always love having some freedom in what they do. To review the science lesson on the life cycle of the butterfly, we first filled out a graphic organizer. Then we had a quick slide show and [wireless response system] activity. The next day, we made a model of the life cycle of the butterfly and redid the [wireless response system] activity. We discussed the results before and after and decided that having the graphic organizer and the model helped nearly everyone in our class remember the names of the stages of the life cycle.

Thinking about the discussion of the Sustainable Classroom Project cohort in the threaded discussions earlier on the chapter, she mused:

I know that the nonlinguistic strategy is an important strategy for students, but with so much material to cover, it is one that is easily forgotten. Second graders do get many opportunities to participate in the nonlinguistic strategy, since making models, using manipulatives, drawing diagrams, etc. are all teaching techniques the lower elementary grades use on a regular basis. I suppose we will have to continue to discuss with our peers the importance of incorporating some of the strategies.

Then she shared a mission she was on:

I also am on a mission to get an interactive whiteboard with response units in every classroom in our building. I cannot tell you what a difference in participation I have seen when we use the whiteboard and [the wireless response system] in my classroom. After the NCCE conference, there are a few more people from our district who are now aware of the endless possibilities these two pieces of equipment offer.

Student evaluation of the lesson indicated that:

- ◆ 95% of the students said they absolutely or mostly understood the lesson ideas;
- ◆ 86% believed the instructional strategy absolutely or mostly helped them understand the ideas;
- ◆ 86% believed the technology absolutely or mostly helped them understand the lesson ideas; and
- ◆ 90% absolutely or mostly liked how they learned the lesson.

INSTRUCTIONAL STRATEGY 6: COOPERATIVE LEARNING

Unit Topic: Mathematics – Story Problems

Technology Used: Interactive whiteboard, wireless response system

Like nonlinguistic learning, the philosophy of *Chapter 7: Cooperative Learning*, was a strong affirmative belief of Kelly's. She immediately noted, however, some uses for cooperative groups suggested in the Marzano text that would be helpful in her classroom:

I enjoyed reading this chapter since I know how valuable this strategy is for student learning. There was one interesting use of cooperative learning that I had never considered for elementary students. The teacher had cooperative learning groups for the entire year that checked with each other at the beginning of each day and just before going home to make sure daily chores were taken care of. I thought this was a great idea and would save me from having to go over what students need to take care of before the start of the day.

Kelly also compared what she was doing in her classroom to some of the research discussed in the text:

The book also listed three guides for using cooperative learning. The three guides are: grouping by ability should be used sparingly, keeping groups rather small, and applying cooperative learning consistently and systematically but not overusing it. I try to group students by having one high ability, one low ability, and one or two middle ability students in each. This combination seems to work the best along with keeping the group size at two or three. I have tried four students in a group but have found that this doesn't usually seem to work as well as three since students at this level often have a difficult time sharing jobs. With groups of three and having three jobs to complete, everyone knows what they need to do and the tasks get done. After reading this chapter, I know that I need to incorporate more cooperative learning. I seem to use informal groups (the pair-share, turn-to-your-neighbor) most and should work on incorporating the other types more often than my once a week goal.

The experimental cooperative learning lesson Kelly developed was a lesson on solving mathematics story problems. Her goal was that the students would be able to solve story problems and would know the words for determining whether a math problem was addition or subtraction. With this strategy, she decided to group student in pairs or groups of three to solve the story problems.

The outside observer attended this lesson and wrote the following observations:

Observation #2:

Kelly began the lesson by asking students to find another student they haven't worked with recently and move a chair beside one of their desks. Students did this quickly with little discussion.

When the students were settled, Kelly put a completed story problem with spaces for its four part answer – thought, information, plan, and solution – on the interactive whiteboard and read it to the students. Students were assigned to work with their partner to solve the problem and were told that they could not show the teacher their answer until they had discussed it with their partner and both agreed on the answers. Also, when they were done solving it, they were told to create a drawing that illustrates their answer. All pairs of students worked on problems and discussed their answers.

Kelly selected a pair of students to go to the interactive whiteboard, highlight the important information in the story problem, and fill the information in the blanks. The other students corrected their work by comparing their answers to the information written on the board. If they had different information, Kelly asked the class to decide which responses were correct and to explain why they thought they were correct. The students were attentive and involved in discussing responses with each other. Kelly told students how to apply points to grade their work and asked them to count the points they got and write the number on their papers. The students then returned to their own desks.

Kelly displayed an evaluation sheet on the interactive white board and told the students how to use their wireless response system units to put in their grades. She then showed students a graph of their grades. The students were very interested in their grades and how they did compared to others.

Finally, Kelly put a new story problem on the interactive whiteboard and told students to work the problem by themselves. After Kelly read the story problem aloud, the students worked individually at their desks. Kelly moved around the room and collected student papers and distributed assessment rubrics as they completed the problem.

Kelly was not altogether satisfied with the cooperative learning lesson. She wrote:

This week I taught my lesson on cooperative learning but found myself a bit disappointed on how the lesson went. In trying to evaluate what I think happened, I guess I have several things that

come to mind. My student teacher uses cooperative learning quite a bit which might have been a factor in how my students responded to working with a partner. Her lessons do not seem to be as structured as mine so expected student behavior during cooperative learning is not as clear to the students. I suppose I should have gone over the expectations, but I thought a brief review was sufficient since they have worked with partners before. Another reason might have been that I should have assigned partners to make sure students were paired with someone with whom they would have benefited working with.

In checking the evaluation problem, I did find that some of my students who usually have a very difficult time with the A.D.D. did complete more than I assumed they would. So, as far as helping my students gaining confidence in solving story problems independently, I think the cooperative learning helped those students.

Kelly's belief in the value of cooperative learning and her determination for her students to experience success showed as she asserted:

I think I am going to try presenting this lesson again with another story problem not only because I would like to see if my students can do a better job but also because the [wireless response system] results indicated they did learn from the lesson. I believe this set of votes is the most consistent as far as how students felt about the lesson, the technology and how they learned. I might even try larger groups and assign students specific tasks.

Since I feel that cooperative learning at this age is a challenging but a valuable strategy to teach children, I will continue to work with my students on it.

When the students evaluated the lesson:

- ◆ 100% believed they absolutely or mostly learned the key ideas in the lesson;
- ◆ 100% thought the instructional strategy absolutely or mostly helped them learn the lesson ideas;
- ◆ 100% thought the technology absolutely or mostly helped them understand the lesson ideas;
- ◆ 94% absolutely or mostly liked the way they learned the lesson.

INSTRUCTIONAL STRATEGY 7: SETTING OBJECTIVES AND PROVIDING FEEDBACK

Unit Topic: Spelling – Word Families

Technology Used: Interactive whiteboard, document camera, wireless response system

Kelly found *Chapter 8: Setting Objectives and Providing Feedback* challenging. "...setting objectives," she wrote, "is something my students don't do on a regular basis for individual lessons." Kelly continued, "I do have my students set reading and math goals for the month and they get feedback from our Accelerated Reader tests and Math Facts tests, but to have them set a goal for a specific lesson did have me thinking."

As she struggled with the research and strategy, she reflected:

I think the value of having students set their own goals does increase learning. The one concern I would have with goal setting on individual lessons would be that the main objective may not be met. I feel there needs to be some guidance so students meet the objective of the teacher but have some freedom to expand on what they need to learn and what they want to learn.

The goal for Kelly's experimental lesson was that students would know the word families and review spelling words. She wanted them to set goals for how many words they could make for each word family using their spelling lists as guides.

The outside observer attended the class period when Kelly tested the lesson and recounted the lesson.

Observation #3:

Kelly began by telling the students that her goal for the day was to help them review their spelling words and know all of the word families they have studied. She displayed the lesson's objective on the interactive whiteboard as she talked about it. The students listened attentively. Then she displayed a list of words under a word family name on the interactive whiteboard with one incorrect word in the list and asked students to use their wireless response system to designate the word that did not belong in the family. When all had selected, Kelly showed students a graph of correct responses. The students were very enthusiastic with the game. She continued this process with several word families. Students cheered when everyone in the class got the correct response and groaned when they didn't.

Next, Kelly displayed the name of a word family and asked students to see if they could find three words in their spelling lists that fit in that family. She focused on the fact that she had set a goal of three words and asked students if it was OK to find more than three words – i.e. to exceed the goal. Students replied that it was good to exceed the goal. Then, Kelly asked students to look in their spelling books and find a word family. Once a student had selected a word family, she asked that student to set a goal for how many words the student would try to find for that family. The student set a goal and she and the other students proceeded to find enough words to meet the goal. The students were very eager to help. Kelly selected a second student to demonstrate setting and accomplishing another word family goal. The student named the word family, set a goal for the number of words s/he could find in the family and began to list words. Other students assisted in finding appropriate words.

Finally, Kelly handed out paper for students to write on and told students to select a word family from their spelling books, write it on the paper and then write down a goal for the number of words they would try to find in their word family. Students asked questions to clarify the assignment and enthusiastically began working independently to find words. Kelly circulated around the room giving one-on-one assistance as needed. Students shared words they had found with others near them as they worked. When most had finished their lists, Kelly asked selected students to show their completed lists to others using the document camera. Students read the lists of words aloud in unison and evaluated the lists to be sure all of the words belonged in the family. Discussions were held on several questionable words.

When all lists had been shown, Kelly asked students to look at the goals they had set and determine if they had met their goals.

Kelly's analysis of the lesson indicated that her ambivalence about second grade students setting goals had subsided.

The lesson I taught on setting goals went well. My students seemed excited about setting their own goals for being able to find words with the same endings using their spelling books as a guide. However, I did notice at first my students were reluctant to set their goals as high as I had hoped they would. However, by the end of the lesson, most of the students were trying to set higher goals and some even set them too high. They asked whether or not they could change their goals, and I decided that they could. We talked about the fact that even adults change their goals if they do not seem to be right.

After teaching the lesson using the interactive whiteboard to demonstrate the concept and then having students vote on correct spellings, I had an idea who understood what to do and who would be needing help. I think I will continue to do review lessons in this manner since some of the responsibility to review the words rests with the students. By having my students set their own goals, they had more ownership in the assignment and hopefully found that they learned more than they would have if I'd been the one to set the goals.

From the comments my students made, I think some of them finally realized how many words they can spell when they know the endings. I've already seen some of the review words and related words come up correctly spelled in the written work which is what I was hoping I'd see. This was a great lesson to use with my second graders because it gave them an opportunity to set goals and see whether or not they could reach them immediately.

In the student evaluation of the lesson:

- ◆ 89% thought they absolutely or mostly learned the lesson ideas;
- ◆ 72% thought the instructional strategy absolutely or mostly helped them learn the ideas;
- ◆ 94% thought the technology absolutely or mostly helped them learn the lesson ideas; and
- ◆ 94% absolutely or mostly liked the way they learned the lesson.

INSTRUCTIONAL STRATEGY 8: GENERATING AND TESTING HYPOTHESES

Unit Topic: Reading – Character Traits

Technology Used: Interactive whiteboard, document camera

Kelly had frequently used the instructional strategies found in *Chapter 9: Generating and Testing Hypotheses* with her students in science units. She wrote in her journal, “The chapter deals with generating and testing hypotheses which has always worked well in science.” Then, she noted the skills and challenges of the strategy for young students, “Students at second grade level need lots of opportunities to gain information in order to be able to successfully develop and test hypotheses....” She went on to reflect:

I think it will be interesting to try to expand having students generate and test hypotheses in other areas. The book mentions the challenge of students not having enough background information to develop and test hypotheses. I think perhaps that will be the most challenging part. I have used centers to help students gain the information they need, and I have used direct teaching. The whiteboard and document camera have helped me take notes to guide my students through the process. I just have to work on expanding into other areas.

The lesson Kelly developed was in one of those “other areas” – reading. Her goal was that students, with a little information, would learn to predict the character traits of a given character. She also wanted them to be able to justify their predictions and then affirm or change their predictions as they got more information. She began by introducing the *Story of Dandelion* from their reading textbook and using the interactive whiteboard to lead students in brainstorming character traits of people and recording those traits. Students then looked at the cover photo and wrote their predictions of Dandelion’s character traits. As the students and teacher read the story, students reviewed their predictions and justified them or changed them. When the story was finished, the students used the document camera to share the predictions they had written and discuss their thinking with the rest of the class.

Kelly discussed her lesson:

After having such a difficult time trying to decide what to teach for this strategy, I felt good about the lesson on characterization I taught using generating and testing hypotheses. I did have to adjust the final requirement because of time. I had my students write down the page number and the paragraph their justification could be located in rather than write out the sentences. From the evaluation piece, I know my students had a better understanding of how to justify their statements from information in a story.

Kelly continued her thoughts:

I believe it is important for students to begin thinking about justifying their thinking using information from texts. I think as we continue to practice this strategy, my students will gain confidence and speed in coming up with supporting details.

Finally, in thinking about another of the values of using the technology, Kelly wrote, “We used the interactive whiteboard to come up with ideas for character traits since my students did not have enough prior experience to generate a statement about the main character. Since I saved the list of characteristics, I will be able to reuse it for future lessons.”

Student evaluations of the lesson indicated that:

- ◆ 94% believed they absolutely or mostly learned the key ideas in the lesson;
- ◆ 100% thought the instructional strategy absolutely or mostly helped them learn the ideas;
- ◆ 81% believed the technology absolutely or mostly helped them learn the lesson ideas; and
- ◆ 94% absolutely or mostly liked the way they learned the lesson.

INSTRUCTIONAL STRATEGY 9: CUES, QUESTIONS AND ADVANCE ORGANIZERS

Unit Topic: Reading/Social Studies – Christopher Columbus

Technology Used: Interactive whiteboard, wireless response system

As with most of the previous strategies, Kelly was very familiar with most of the techniques found in *Chapter 10: Cues, Questions and Advance Organizers* and often used them in her classroom. “The lessons I teach,” she wrote, “usually begin with cues to have students think about prior knowledge. Years ago, the ‘set’ was one strategy that was looked for in a well-planned lesson, so I have gotten used to beginning my lessons using cues.”

Kelly continued:

I am sure you remember the days of having Bloom’s Taxonomy questions posted in your room. I probably still have those posters somewhere. They were helpful in getting me to ask higher level questions during my lessons. Now, most of our teacher guides have higher level questions incorporated into the lessons. I would hope that when students are asked higher level thinking questions, I give my students enough “think time.” I know I often feel rushed because of the schedule, but I know how important it is to give students a chance to organize their thoughts. It’s something I have to conscientiously focus on when I’m teaching.

Kelly decided to use a KWL chart as an advance organizer for an upcoming social studies/reading lesson on Christopher Columbus. In preparation, she put a Kidspiration KWL chart on the interactive whiteboard. Before beginning the reading, Kelly asked students what they **Know** and **Want to Know** about Christopher Columbus. The students were called upon to put information in the chart on the interactive whiteboard. After they read the textbook article, they went back to the chart and highlighted the information that they **Knew** that was on the list and added information they had learned to the chart. Then the students listed information that they still **Wanted to Know** and looked it up on the Internet.

After the KWL chart was filled out and the class had discussed the information, Kelly used the wireless response system to check if students gained basic information from the reading. Finally, she displayed the completed KWL chart and had students write a paragraph about what they had **Learned**.

Kelly evaluated the lesson:

I just finished teaching a lesson about Christopher Columbus from our reader using a KWL chart as an advanced organizer for Chapter 10. I kept aware of asking higher level questions throughout the lesson and helped guide students through the completion of the chart. With the use of the highlighters and the [wireless response systems], I believe my students got a better understanding of the lesson than they have previously. As I have often mentioned..., having the technology of the interactive whiteboard and the response units in my classroom has had a tremendous impact on the level of attentiveness I see throughout the day.

With the higher level questions being asked in the lesson, I could see a difference in the types of information my students were writing about in their paragraphs. Having them use the notes we took on the Kidspiration chart helped them justify their thinking. Some even asked questions on their own which they tried to answer using what they had learned. This lesson was a fun lesson to teach since there was so much I could do with the interactive whiteboard to help my students understand the article in the reader. I also loved being able to look up the information they still wanted to know on the Internet to show them that often the questions they have need to be researched in a different manner.

Student evaluation of the lesson indicated that:

- ◆ 95% believed they had absolutely or mostly learned the lesson ideas;
- ◆ 95% thought the instructional strategy had absolutely or mostly helped them learn the ideas;
- ◆ 100% thought the technology absolutely or mostly helped them learn the ideas; and
- ◆ 100% absolutely or mostly liked the way they learned the lesson.

CHAPTERS ELEVEN AND TWELVE: COMPLETING THE STUDY

Chapters 11 and 12 provided a chance for Kelly to reflect on what she had done “right” with various instructional strategies during the past year and set goals for the next year.

“I was pleased to read that teaching vocabulary is important,” she wrote. “With so many lists of words to cover to help out students with the Washington Assessment of Student Learning (WASL), sometimes I feel a bit guilty spending so much time working on vocabulary words, but after reading about the difference it makes, I guess I won’t be feeling that way anymore.”

Kelly also commented on the value of the technology provided by the grant. She said, “I have been very pleased with the use of the interactive whiteboard and document camera for showing samples of writing. I think my students understand the writing process better since we’ve been able to highlight sections of papers that are strong in the areas we’ve been addressing.

In thinking about next year, Kelly reflected: “I know it will take some time for me to be able to incorporate the strategies easily into my lessons. I have made some notes that will help me next year as I plan since I know which strategies made the most difference in the lessons I’ve taught.”

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