

**Pumping Up Students' Reading Scores:
From Predicting Understanding, to Mastering
Performance (P.U.M.P.)**

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ABSTRACT: In an era where standardized tests are the buzz, the eternal question is: "Are my students ready?" Do you wonder if students are mastering the multifaceted aspects of literature development? This inquiry takes a closer look at discussion groups in a fourth grade classroom for methods of teacher planning and preparation that enable students to cement together the various pieces (mechanics, fluency and comprehension) of the reading mosaic. Students were "guided" to participate in high interest texts that serve as springboards for in-depth word analysis, practicing good reader strategies, active discussions surrounding comprehension, and thoughtful written reflections. This presentation includes strategies that were deemed effective in "pumping up" student performance on assessments.

*Based on what we now know,
it is incorrect to suppose
that there is a simple or single step,
which, if taken correctly, will
immediately allow a child to read.
Becoming a skilled reader is a journey
that involves many steps.*

*~Becoming a Nation of Readers:
The Report of the Commission on Reading*

Introduction

“For the times, they are a-changing!” Bob Dylan’s enduring lyrics ring true in education as schools are once again changing the way they look at the curriculum and the way students understand the material that is being presented to them. Due to the changing theories, philosophies and teaching practices, it is important for teachers and interns alike to maintain a reflective and inquiring stance about aspects of their classroom practice. It is this essential component of teaching that enables an educator to continue to grow both as a teacher and a learner.

While deciding our topic for research and exploration for our own teacher inquiry project, as both a novice and veteran teacher, we talked about various issues that impacted our work in our classroom. We discovered that focusing our wondering to one topic that was a burning dilemma was not an easy task. As with other teachers who look closely at their practice for areas to be “fixed,” we discovered that our classroom had several dilemmas from which we could choose. Some of our early wonderings looked at teacher professional development through a lesson study model with a group of teachers, interns, and administrators who would develop lessons, carry them out in the classroom, and then discuss how the lessons could be improved in order to maximize student

learning and engagement. We thought about researching standardized tests and strategies that we could implement to improve student scores in both math and reading. As we pondered our various wonderings, we discovered that although we were excited about many possibilities, there was one that truly excited both of us. As a result, we zeroed in on our dilemma of improving our students' PSSA scores in reading because thirteen of our twenty-three students scored at the basic or below basic level on the third grade PSSA.

Reading became an important subject matter for me as a novice teacher as I began to think about these scores. I looked at the role reading has in my life and the importance I place on it. Reading is often my escape and my opportunity to relax from a hectic school day. I find nothing more rejuvenating than basking on the beach in the summer sun as I burrow my feet into the cool sand below the surface. Or as I read by the fire, sip hot chocolate, and fall deep into a warm blanket on a cold winter day. In viewing myself as a person who loves to read, I began to break down the process I go through as a reader. I read slowly as I get into the characters and the plot of the book in order to make connections. I often find myself re-reading main ideas and phrases. Reading to me is like making food in a crock pot. Marinating all day, the various vegetables and meats mix together to make a savory, delicious meal. Just like cooking in a crock pot, slowing down while reading allows the various ideas and characters to mesh together to make a flavorful story.

I became even more intrigued to encourage, as well as teach young children to read after attending various professional development reading workshops. I would leave the workshops excited about working with more strategies, especially what is known as

“the great eight” in the State College School District – monitoring, previewing, self-questioning, making connections, visualizing, knowing how words work, summarizing, and evaluating. I was eager to incorporate this in my classroom and to set-up reading instruction that was more focused on a guided reading format that looked at the intensive and extensive aspects of reading.

Taking these ideas to Priya, my mentor teacher, we decided that it would be valuable as a pre-service teacher and as a veteran teacher to look together for strategies that would be effective in helping students do more than just connecting what they read to their lived experiences. We wanted our students to place the focus on making connections while comprehending the text, improving fluency, questioning the text, and understanding how to use other resources such as dictionaries.

“How do you do this?” becomes an ongoing question for many teachers and one that we were inquiring to understand both as an intern and mentor teacher. In an era where standardized tests are the buzz, how can we as teachers prepare our students for success on the reading sections of the test? McLaughlin and Allen (2002) noted that “it is impossible to anticipate every reading opportunity learners will encounter along the way, readers must learn to use a variety of tools in diverse contexts, thus developing a repertoire of strategies.” We were wondering how to effectively teach reading strategies in order to maximize student learning and promote reading comprehension. We were interested in helping our students become better readers who manipulate ‘good reader strategies’ while they comprehend the text. We wanted to help our fourth graders’ improve their mechanics, fluency, and comprehension skills while being immersed in authentic reading opportunities.

We were led to these initial wonderings by PSSA scores, and due to the fact that our fourth grade classroom of twenty-three students has a wide range of social and academic abilities. While many of our students were able to read fluently, others were struggling to decode even the simplest words. In spite of the variability among their reading abilities, we discovered that the majority of our students were having difficulty comprehending and paying attention to the details in the material with which they were provided. In addition to reading, we have discovered that there were students in our classroom who lacked the motivation and the impetus to emerge as leaders. While many of our students possessed leadership qualities, they often did not use them appropriately in the classroom. We decided to capitalize on our students' interpersonal skills as we placed them in groups that would encourage them to interact with others in the classroom as they discussed the books that they were reading.

Final Wonderings and Sub-questions

After considerable thought and collaboration, we narrowed our wonderings by looking at these two components of classroom interaction: social and language development. We realized that literature discussion groups would provide students with thoughtful literacy instruction that would improve reading skills and comprehension in small homogenous groups. In accordance with Vygotsky's principles, "students should be taught within the zone of proximal development...Instruction within the zone should incorporate both scaffolding and social mediation (McLaughlin, 2002)." Therefore, our goal was to incorporate a guided reading program that would provide students with opportunities to interact with each other and the material, while engaging in need based creative and meaningful activities to promote reading for comprehension. Our final

question was, “*How can a fourth grade students’ participation in literature discussion groups enhance their comprehension, motivation and self-esteem?*” In addition, we discovered sub-questions that enabled us to look at smaller pieces of this broader question:

- Which activities and mini-lessons would be the most helpful for students to engage in during their literature groups?
- How should reading groups be structured to maximize student participation and time on-task?
- If the literature groups become student lead, will this help improve student motivation and self-esteem?
- Will the literature groups also improve students’ writing abilities and thereby their district test scores?

Literature Review

Harvey Daniels (1994) presents two terms that are essential to having great conversations about literature in a classroom: collaborative learning and independent reading. Collaborative learning is rapidly becoming the key to fostering high student motivation, interest and academic success. Daniels argues that independent reading when joined together with a collaborative learning model creates a more enthusiastic and reflective group of readers. Students are more likely to choose to read and to develop a love for reading if they are provided with such models of reading instruction. He maintains that students who are excited about reading and books in their childhood are more likely to become lifelong readers.

Peterson and Eeds (1990) discuss the four components of literacy: story in the home, sharing story with a group, extensive reading and intensive reading. These components became the foundation for our classroom reading instruction. We thought

about the knowledge and experiences that each student brings to the book that they are reading through their stories from home. These stories then become the basis for the conversations in which they engage during the teacher facilitated literature discussions. Peterson and Eeds maintain that students need time to read and enjoy a variety of written media. They cite Louise Rosenblatt (1978) in stating the intensive aspect of “reading is a transaction, a bringing meaning to and taking meaning from the written text.” Students need to be guided to use their experiences from their own lives to comprehend and make connections to the text that they are reading. Iser (1974) asserts that good writers leave blanks in their books for the reader to insert their own experiences to make sense of the story. These individual experiences transcend the meanings at the surface of the text to delve deeper into what is not written. It is this aspect that separates a good reader from a struggling reader.

We noticed that our class had variability in the interest, motivation and abilities with regards to reading. We therefore decided to follow the advice of reading experts and create homogenous groups where students would be guided to listen to each other’s experiences and connections to situations and characters in the book. As we observed our students with their books, we noticed that although many of our readers were able to do this when guided by the teacher and others in the group, they were often unable to decode specific words on the page. We therefore wanted to provide students with a 10-15 minute mini-lesson on specific strategies and techniques that the students could use to become more confident decoders, which in turn would increase their comprehension of the text.

Classroom Context

Our classroom of twenty-three fourth graders creates a busy room with unique abilities, interests, experiences and needs. As you may imagine, there are no two students who are alike. In this heterogeneous mix of the twenty-three students, there are ten girls and thirteen boys. While the majority of our students are achieving at grade level or above, thirteen of our students scored at the basic or below basic level in the third grade PSSA. We have four students who receive enrichment services and are accelerated in several subject areas. With this said, we do have three students who are on medication for ADHD and have difficulty sustaining their attention to tasks that are required of them. Out of the twenty-three students, we also have seven students who are below grade level and are receiving additional support through learning support or Title 1. Most of the students who are receiving these extra services leave the room for small group instruction during reading, spelling and math. Therefore, some of these students are not present for reading instruction while other students remain in the classroom. A few students even split up the instructional time between the classroom teacher and the Title 1 or learning support teacher. They leave the room for extra support that usually follows-up on what they have worked on in the classroom. It is dependent on each child's needs as to what type of instruction and support they receive in order to set up the individual for successful learning opportunities.

Interventions

While we always valued reading instruction in our classroom, the lessons that we created looked different after we began our inquiry. After attending various professional development reading seminars and performing background research by reading

instructional textbooks, we were both enthusiastic and ready to improve the reading instruction in our classroom. We began to incorporate a guided reading/comprehension teaching style into the classroom where there was a mix of teacher-directed whole-group instruction, teacher-guided small-group instruction, and independent comprehension and response activities. We opted to use this comprehension model in the classroom because through whole-group, small-group, and independent practice students could apply comprehension strategies in multiple settings (McLaughlin 2002).

Before we could begin our reading instruction, we had to group the students into four different groups that could work effectively together in a small-group setting. We made the groups partially based on the State College Area School District's reading assessments that were given in the fall. These assessments allowed us to look more closely at student's reading abilities and group them based on similar needs. For example, all of our title 1 and learning support students who remained in the classroom for reading instruction were grouped together based on similar abilities and needs. This would then allow for us to pick appropriate texts for the students to read that would be just right for instructional purposes. In addition to looking at our reading assessments, we also took into consideration the anecdotal records that we had maintained of our students over the course of the year. We thought about the qualities inherent in each student that would enable the students in each group to work collaboratively and appropriately. For example, we knew that two particular students would be off-task by talking to one another during reading instruction. Even though these students had similar reading abilities and could have been placed in the same small group, we did not put them together.

Once the different groups were established, we then had to pick appropriate texts for each group. We did this by finding texts that matched each groups' instructional level. Since the students would be reading these books independently, and in a teacher led small-group; we wanted texts that would challenge the students during small-group, yet the students could read the text during independent time. Ultimately, we looked for texts that would encourage critical thinking and leave questions to be answered for the students (McLaughlin 2002).

We ran our guided reading instruction three days a week for about an hour each day. There were four stations each day which allowed for one group to work at a station. We created a chart that enabled each group to be clear on where they were to be during each cycle. *Station one* was teacher-led small group instruction where the teacher presented the strategy that was to be practiced for that particular week. *Station two* was a follow-up to *station one* that provided additional practice and reinforcement with a similar and yet different activity. *Station three* was usually a student led small-group critical thinking activity. During this time students used a variety of critical thinking activities such as playing the game *Boggle* where the objective was to create as many words as you can from sixteen letters. At this station students might also be reading a passage followed by a series of comprehension questions they had to answer, the format of which is similar to the PSSA tests. These comprehension questions were both open-ended and multiple choice which forced the students to re-read the passage and to look carefully at it for details. For example, the students had to read an article about a flea market and then answer five multiple choice questions. They then had to answer the following open-ended prompt: what did you learn about flea markets, give three

examples to support your answer. Be specific and make sure you use the proper paragraph format with a topic sentence, supporting details, and a conclusion.

Finally, *station four* was an independent genre study where students had to complete various assignments for books in the different types of genres. The genres in our center were: pop-up books, visual discrimination books, theme books, magazines, fables, and tall tales. In each genre folder there was an assignment that the student had to complete after reading a specific genre along with an example of the completed assignment (**See Appendix 1**). For example, in the fable genre study the students had to choose two fables and complete a Venn diagram to show how the fables are alike and different. Then the students had to write a fable of their own with a moral or lesson at the end. The groups then rotated through each station in twenty-minute increments. This allowed the teacher to meet three groups a day, permitting each group instructional time at least twice a week.

During the teacher led small group instruction, the teacher taught mini-lessons that focused on ‘good reader’ strategies. Again, we focused on one strategy per week. The first strategy was predicting/previewing what will take place in the text. This took place before beginning the text, the purpose was to provide students with the opportunity to predict what will happen in the text. The students were only allowed to look at the cover of the book and the title in order to predict in writing what they thought would happen in the story. This strategy was used to activate prior knowledge as well as establish a purpose and excitement for reading the text.

The following week we worked on a strategy to help readers determine unknown words. The teacher hid words in the text with sticky notes and the students had to figure

out the unknown words. This allowed the students to rely on the pictures or the rest of the sentence in order to figure out the unknown word. From a practical point of view, this is an important strategy that provides a solution for the reader while reading a more difficult text. In addition, the reader must be following closely to the text and actually comprehending the context of the sentence rather than simply reading the words on the page.

The next week we focused on the *key word strategy*. The *key word strategy* provided readers with the opportunity to pause after reading a paragraph and select a word or a short phrase that could summarize the main idea of that particular segment of the text (LAC 2003). The students would then use sticky notes to write their word or phrase on, and then stick it next to the paragraph it summarized. This strategy helped our students to slow down their reading in order to think about main ideas and comprehend the text (**See Appendix 1**).

The following week we focused on the *I wonder* strategy which allowed students to ask questions while they read. This strategy was used in order to help students monitor their comprehension, maintain engagement with the text, and activate prior knowledge while reading (LAC 2003). This strategy can be used before, during, or after reading. While reading the students must think about what the text is saying and develop questions based on something that the text does not answer. For example, while reading a text on William Penn the students might ask, *why can't a building in Philadelphia be taller than the statue of William Penn?* The students are then encouraged to look outside of the text to find the answer to their wondering (**See Appendix 1**).

Finally, the last week we had the students create a bookmark when they finished reading the text. This was used to summarize the text, as well as to use as a reference for some of the good reader strategies they learned over the past few weeks. The students had to rate the book on how well they enjoyed it and explain why they rated it what they did. They also had to pick a word from the text that they felt was a good vocabulary word for the entire class to know. The bookmark was used as a way to evaluate the text, make connections and judgments about the book, and to promote discussion about the text (See Appendix 1).

Data Collection

As every child in our classroom has unique interests and needs, we collected data on all our groups to give us a sense of how our students were responding to these interventions. In order to solidify and prove our findings during the interventions, we needed to collect data in order to back up our conclusions. We used a diverse method of data collection to accumulate an array of data that could support our claims.

Student Surveys~

Our first method of data collection was the student survey given at the beginning and end of our project. We thought this would be a helpful tool to help determine a baseline of our students' perspectives on reading. We used a "reader self-perception scale" that provided us with information on how students view themselves as readers. The students had to pick between five choices to show how much they agreed or disagreed with each statement. Example statements were: "I think I am a good reader." "I can tell that my teacher likes to listen to me read." "I like to read aloud." We also used a "Metacognitive Strategy Index" survey that allowed us to evaluate what our students do

before reading, during reading, and after reading. This helped us to assess what reading strategies our students are already using and which ones needed to be introduced or reinforced. Both surveys were taken from Mary Beth Allen and Maureen McLaughlin's book Guided Comprehension (See **Appendix 2**).

Teacher Observations and Anecdotal Notes~

During teacher-led small-group instruction it was important to observe and pay close attention to what the students were saying and doing while reading and learning. You can often learn a lot about a student's reading ability by simply observing their interactions with the text and participating during small-group instruction. Taking anecdotal notes was a way for us to record these interactions (See **Appendix 3**).

Student Work~

We collected and studied student worksheets, assignments, and reading reflection logs in order to analyze student progress and growth over the span of our inquiry project. Looking at quality and quantity of these artifacts allowed us to pin-point specific mini-lessons or strategies that showed progress or no progress for certain students (See **Appendix 4**).

Student Reflection Logs~

The students were asked to reflect on a daily basis. These reflections show the students' opinions and understandings of the 'good reader' strategies that were presented to them. In addition, this data highlights student growth in the use of strategies in their independent reading.

Lesson Plans~

There are a few lesson plans that we used in presenting the mini-lessons of ‘good reader’ strategies to the students. The lesson plans indicate the preparation that goes into effectively presenting the information to the students (**See Appendix 1**).

SCASD Reading Assessments~

The State College Area School District requires teachers to give their students a reading assessment in the fall, in the spring, and at the end of the year. This reading assessment was a great way for us to look at student’s reading comprehension abilities and how they have changed from the fall, before our inquiry project, and then again in the spring after our inquiry interventions.

Data Analysis

After the interventions were put into place and several lessons were taught, it was time to analyze our data. We decided that rather than to create themes that we wanted to look at prior to reviewing the data, we would look at themes that emerged out of the data. We reviewed our data and due to the large quantity of evidence, we decided to focus on three students in particular. In looking at the data collected on these three students, patterns began to emerge and it was clear that each of our three students showed growth through a deeper engagement in the text and interactions with others. As we continued to look through the data we saw that there were important pieces of evidence that supported our claims from other students in the class as well. By only focusing on our three chosen students and not including these other students’ voices, we felt that we were doing a disservice to the quality of our inquiry as we were missing pieces of the puzzle that make up our classroom.

As we reviewed the data, the following common themes emerged:

- Providing various activities during literature station time increases students' time on-task, motivation, and interest.
- Limiting comprehension strategies to one per week provides students with multiple opportunities to practice the focus skills in a small group. Then, students can continue to practice and reflect as they complete various tasks independently.
- The connection between content and literature stations leads to increased student comprehension and the implementation of strategies in student written responses.

In the following section, we will present you with the evidence from our multiple data that supports each of these claims.

***Claim #1:
Providing various activities during literature station time increases students' time on-task, motivation, and interest.***

This claim can be solidified using various pieces of data, but especially through our teacher observations. It was amazing to see the amount of time students were on-task during reading stations. Independent work time can often be a time where students are distracted by socialization, but our reading stations seemed to have the majority of the students on-task. We believe that this was due to the variability that the students were offered at each station. For example, students rotated between word manipulation games and comprehension building activities, to reading high interest books in ten different genres.

In surveying students as to what their favorite part of reading groups was, several students explained that independent work was their favorite. One student said:

“I like [independent work] best because you get to read books and do different activities with them. There is always a challenge somewhere in the activity. I also

like this station because it's independent. Everything is quiet. Quietness helps me concentrate, it also helps me get my work done.”

Clearly, from this student's point of view, the room was quiet which indicates that students were using their time wisely. This particular student also enjoyed the challenge associated with the activities. The difficulties in the activities were just enough to really motivate the students to think and concentrate on their work. For example, one of the genre centers asked the students to create their own ABC book. In looking at student work, it was evident that the students were focused and interested in completing quality work. In **appendix 4** you will see one of the ABC books created by one of our students. The originality in the text really allowed me to see that the student took her time in creating a unique page for each letter of the alphabet. This particular student made an ABC book that was 'all about her.' This book was distinctive to her as a person and really allowed me, as the reader, to get to know the individual student. The quality of the student work across the class indicates that the students were on-task and motivated to complete the appropriate task at hand.

Another piece of student work that clearly indicates student motivation and on-task behavior was from the station where students had to read a passage and answer a series of comprehension questions. In **appendix 4** you will see several of the written responses that include all of the appropriate parts: a topic sentence, supporting details, and a conclusion. The students even went back into the text to find evidence to support their claims. For example, while writing about what you can find at a flea market one student wrote, “In the passage, it said that Bethany saw stuff like wind up toys, tools, dried flowers, candles, paintings and home accessories.” This work shows the high-level of motivation this student had during his independent time to complete the work to his

fullest potential. After reading the students written response, I immediately had a huge smile on my face as he incorporated all of the necessities of a paragraph that we discussed in class.

Yet another example that depicts student motivation and interest level was a student who explained that the genre study allowed her to incorporate art into her reading as she created the various projects associated with each genre. The student went on to say that “I never [read] the right genre for me before. Genre study gives [me] the chance to try [to find] the right book for [me].” Genre study opens the doors to a diversity of texts as it motivates students to read. A student might think that they do not like to read until they find the perfect type of book for them.

Small group instruction effectively promotes on-task behavior as students are continually engaged in a discussion, or learning and practicing a new strategy. One student explained, “I like discussions with Miss Fox and Mrs. Poehner. I like it because I think arguing with other people is fun because you get to share your opinion with other people and hear what they have to say.” As we discuss the texts in our small groups, students feel confident sharing their differing ideas and opinions. For example, one day while reading the book *Just Plain Fancy* by Patricia Polacco, one of the students was wondering why the main character, a little girl, was afraid of being shunned by her Amish community for the ‘fancy’ egg she had found. This student thought that the girl shouldn’t be shunned for something she found, as long as the character in the book remained ‘plain.’ Then another one of our students argued that she could understand where the character in the book was coming from because the fancy egg belonged to her. This led to a great discussion in the group about whether the girl should be shunned or

not. The students were giving various opinions and points of view about the topic and felt as though they could disagree with a peer. The discussion clearly defined how the small group allowed the children to feel comfortable and motivated to engage in an on-task debate. This was especially interesting as this was a group that had been quieter earlier in the year and did not seem to be able to discuss a topic from various perspectives. It is apparent that the students in this group enjoyed participating in the group discussion and felt comfortable to share their ideas and opinions. Our teacher driven small group instruction taught students to engage in appropriate student led discussions about the book.

The evidence cited above strengthens our first claim that states that students who are more motivated and interested in the material that is being read are more likely to be engaged in the activity. The variability that our stations provided were able to provide students with the qualities that are essential to inviting students to freely participate and interact with each other and the texts.

Claim #2:

Limiting comprehension strategies to one per week provides students with multiple opportunities to practice the focus skill in a small group. Then, students can continue to practice and reflect as they complete various tasks independently.

One of our goals during this inquiry project was to provide our students with a collection of strategies that they can independently use to comprehend a text. In order to help meet this goal we decided to focus on one ‘good reader’ strategy a week. We thought that an in-depth look at how to properly use each strategy would help solidify how to appropriately manipulate the tools of a good reader. The various strategies we

incorporated were: prediction, 'I wonder', key word, figuring out an unknown word, and summarizing.

In looking at our data it is evident that our weekly approach to teaching the strategies seemed to benefit our students. One of the students mentioned that a good reader is someone who “takes their time and looks at all the information in the words and pictures.” This led us to the discovery that this particular student really grasped the idea of what a good reader must do.

The teacher’s anecdotal records also indicated that during small group instruction one of our students said that a good reader “wonders more than the book offers.” We were impressed that the student was able to articulate their reflections in such a poetic and academically advanced manner. It led us to the realization that this student, along with many others, had really begun to grasp what it takes to be a good reader through the explicit guidance that we had provided them with.

Our notes also showed us that one student in particular was having difficulty during our introduction to the “I Wonder” strategy. He continued to say that he did not wonder anything and was having a difficult time developing questions for the text. Through the course of the day, it was exciting to see him begin to comprehend the strategy as he conversed with others in the group. At the conclusion of the reading period, the students were assigned a chapter to read in their instructional books and to use sticky notes that they had been provided with to jot down aspects of the story that they were wondering about. The next day, this same student was excited to share his experience with the assignment. He was thrilled to share that the ‘I wonder’ strategy helped him immensely while reading his passage. He mentioned, “I get questions in my

head and I want to keep reading so I can answer my questions. The ‘I wonder’ strategy helped me understand the book better. Predicting also helped me because I got more involved in books.” This scenario demonstrates that this student was able to comprehend the strategy and to use it independently when he was given the opportunity to practice at school in a variety of ways.

Claim #3:

The connection between content and literature stations leads to increased student comprehension and the implementation of strategies in student written responses.

The evidence for this claim comes directly from our lesson plans and anecdotal notes. During our data analysis we noticed that the students were making better connections between the strategies that they were learning in their small teacher directed groups, to their written reflections. We looked closely at all the pieces of data that we had collected to look for reasons for this occurrence. We discovered that this was largely due to the ways in which we had planned the activities at each station.

We planned the lessons specifically to create a sequence of similar lessons that would enable the students to practice the main idea that we had presented at the teacher station. For example, one of the lessons was to teach the students to figure out the hidden words by looking at the context of the sentence and the details in the story (**Appendix 1**). For this lesson, we had covered ten words in a big book and had a discussion about how these hidden words could be discovered. We talked about specific strategies that could be used when being faced with an unknown word.

Then we had an independent response station that was an extension of the previous lesson where the students were to look for details in sentences to put the strips in the correct sequence (**Appendix 1**). Once the students were able to identify the accurate

sequence, they cut the strips apart and then glued them on a page in their response stations. In the next independent station, the students manipulated a set of letters to form different words. In our students' own words, "this station was very fun and it helped us to become a better speller. It also helped us increase our vocabulary and [develop] word skills." The final station involved students looking for how words are used in different ways in sentences, which in turn changes the meaning of a word. All of these lessons had the same objective: to teach students to look carefully for details in words and sentences.

In reading student's responses in their journals at the end of each of these lessons, we discovered that the students were able to look deeper at their use of these strategies. They attributed their success to the fact that they were given many opportunities to practice the strategy with their group prior to doing it alone at home. The numerous comments from the students about their positive experiences with the strategy showed us that they were beginning to understand the purpose of the activity and how it could help them during their independent reading. One of our students mentioned, "this strategy helped me understand how words work. I was able to estimate what word would best fit in [the sentence]." Another student stated, "I looked at the size of the hidden word, its shape and the words that came before and after it...As I continued to read, I made a lucky guess and pulled the first part of the hidden word to see if I was right. The first letter was usually able to tell me if my guess was right."

Conclusion and Further Wonderings

We initially developed our inquiry wonderings when we looked at our students' PSSA reading scores and were surprised at what our students could not do. We pictured this inquiry project as one in which we would be trying to fill an empty vessel, our

students, with the knowledge they needed to become successful readers. In the early stages of this project we did not take the experiences that our students already had as readers into consideration, but thought that these students needed to simply learn new skills to help them do better on these tests. Over the course of this project, we became more and more aware of the unique qualities that each student brought to the group and the collective knowledge that already existed from prior years of schooling and reading experiences. We used this as a base for our instruction and tried to enrich their existing experiences with new strategies that could enable them to strengthen their comprehension and motivate them to continue to read and experience literature.

At the completion of this project, we now look at this inquiry through the eyes of our students being a garden of flowers, who simply needed a gardener to help them find the right soil, sunlight, and water to flourish. Our students simply needed more guidance and practice with these strategies to help them become more successful readers.

As a reflective educator, this inquiry project on enhancing the comprehension, motivation, and self-esteem of our students as readers has proved that our journey of becoming an outstanding reading teacher has just begun. We have made huge leaps in understanding how children delve into and understand a text, but we have just begun to scratch the surface. This project has answered our initial question, but has ultimately led us to further wonderings as how to become a reading teacher that will effectively help our students become successful readers, thinkers, and learners. However, we are still just projecting our students' performance on the fifth grade PSSAs. Our students have shown that they are able to successfully decode words and texts that they are given in the

classroom, but it is yet to be seen how they will perform on a test when in a different situation.

As we mentioned earlier, this is just the beginning of our reflective journey as reading teachers. We have several new wonderings that have emerged as a result of our experiences with this project. We are now wondering what would happen if we allowed our students to pick their own books to read during instructional time. Would this just create more chaos as each student could possibly have a different text? Would allowing students to pick their own text create more of a motivation to read? In thinking through this wondering, we came to the possible conclusion that maybe limiting the number of texts that the students could pick from would eliminate the possibility of each student reading a different book. Allowing students to pick their own texts would hopefully encourage students to read for authentic purposes and respond in a meaningful way if the text was something that truly interested them.

In addition, we are interested in investigating how to effectively manipulate a fluency station during reading instruction. A fluency station would allow students to record themselves reading a portion of a text and then play it back to assess their own reading abilities. This would hopefully help the students evaluate themselves as a reader and look for areas to improve. But, how do you allow students to read out-loud during silent reading time? Will this distract other students who are working independently?

Furthermore, we are wondering how to effectively run reading stations when you are the only teacher in the classroom. We are so fortunate to have two teachers, as well as a para-professional to run and monitor reading stations. But, how would one do this if they were alone? This is an especially important aspect of reading instruction as I

consider my classroom next year where there could potentially be no other support. In recently observing a first grade classroom during instructional reading time where there were about six independent stations and a teacher led station, I was amazed at how efficiently the groups were run. The students in this room were quietly on-task while the teacher met with one group at a time. Each student knew exactly what to do, what the teacher expected him or her to accomplish, and how to behave. This led to the realization that reading groups can be successfully run, if and only if, students are carefully taught what to do at each station and trained to work independently. This leaves us with the wondering of how do you effectively teach independence during reading time?

While we have many ideas of how to begin to investigate these further wonderings, we realize that inquiry in a classroom is often messy and unpredictable. To conclude, holding an inquiry stance as a novice or veteran teacher is such a powerful tool. In spite of the difficulties, we acknowledge that the understandings we gain about our students and our teaching can extend beyond the surface and therefore change the way we teach!

Bibliography

Daniels, H. (1994). *Literature circles: Voice and choice in the student-centered classroom*. York, ME: Stenhouse Publishers.

Iser, W. (1994). *The act of reading: A theory of aesthetic response*. The John's Hopkin's University Press.

Language Arts Continuum (LAC) Writing Team. (2003). *State College Area School District Language Arts Continuum (LAC)*.

McLaughlin, M., Allen, M.B. (2002). *Guided Comprehension: A Teaching Model for Grades 3-8*. Newark, Delaware: International Reading Association, Inc.

Peterson, R., Eeds, M. (1990). *Grand conversations: Literature groups in action*. New York, NY: Scholastic.

Rosenblatt, L. (1978). *The reader, the text, the poem: the transactional theory of the literary work*. Southern Illinois Press.

Whistler, N., Williams, J. (1990). *Literature and cooperative learning: Pathway to literacy*. Sacramento, CA: Literature Co-op.

Predicting Centrifugal Pump Performance. by Terry Henshaw. 01/18/2012. It is said that old pump men never die—they just lose their prime—and I fear that is partially true. Therefore, before I lose my prime, I thought I'd share some equations with some of you younger pump-heads, which allow you to calculate the best efficiency point (BEP) capacity and head of a centrifugal pump, knowing only certain impeller and casing dimensions and the pump rotative speed. I have found it quite useful to be able to predict the hydraulic characteristics of a centrifugal pump before it is built, even before the drawings are made. I've also found it useful to be able to predict the effect of changing any of the pump design parameters, even using an impeller from a different pump. Predicting students' performance is one of the most important topics for learning contexts such as schools and universities, since it helps to design effective mechanisms that improve academic results and avoid dropout, among other things. These are benefited by the automation of many processes involved in usual students' activities which handle massive volumes of data collected from software tools for technology-enhanced learning. BibTeX EndNote RIS Cite This Paper. Abstract. Predicting students' performance is one of the most important topics for learning contexts such as schools and universities, since it helps to design effective mechanisms that improve academic results and avoid dropout, among other things. les practice guide. Assisting Students Struggling with Reading: Response to Intervention and Multi-Tier Intervention in the Primary Grades. February 2009. Panel. 3. Provide intensive, systematic instruction on up to three foundational reading skills in small groups to students who score below the benchmark score on universal screening. Typically, these groups meet between three and five times a week, for 20 to 40 minutes. Moderate Low. Pump performance curves give you the information you need to choose the right pump for your application. In this comprehensive pumps article, you will receive a pump curve explanation, learn how to plot a pump curve, and learn how to compare pump curves for selecting the right pump for the job. 1. how to read a centrifugal pump performance curve? Curves typically include performance metrics based on pressure, flow, horsepower, impeller trim, and Net Positive Suction Head Required (NPSHr). Centrifugal pump curves are useful because they show pump performance metrics based on head (pressure) produced by the pump and water-flow through the pump. Flow rates depend on pump speed, impeller diameter, and head. What is Head? Bottom Up Processing. This processing happens when someone tries to understand a piece of writing by looking at individual meanings or grammatical characteristics of the most basic units of the text, An example of this type of processing is asking learners to read a piece of writing to focus more on form rather than meaning. Top Down and Bottom up Processing in Listening. Now we are going to learn how top down and bottom up processing is used when teaching listening. Top Down Processing in Listening. Exercises that require top-down processing develop the learner's ability to do the following