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Building Vocabulary in Secondary Classrooms Using Best Practices

An Action Research Report by
Rebekah Lund and Amanda Johnson

Our action research project began with finding a common denominator between a Mathematics teacher (Amanda Johnson) at a rural, alternative school and an English teacher (Rebekah Lund) at a rural, k-12 school. We wanted to research something that was relative to both of our struggles as teachers and the content in our classrooms, which are different in content, but similar in structure. Many of our students come from low-income backgrounds, where education is not always the primary focus. For Amanda in particular and somewhat Rebekah, many of our students are working through problems that are larger than academics, such as addiction, involvement in the court system, and family issues. So we discussed multiple ideas for our research, including increasing parent involvement and improving formative assessment. What we finally settled on researching was how we could better teach students vocabulary specific to our two content areas, with the hope of sharing our findings with other content areas as well. Our problem we decided was that our students' vocabularies were lacking due to limited exposure throughout their home and academic histories and also due to superficial, quick, and ineffective teaching of vocabulary previously in our classrooms. We wanted to be able to enhance our students' academic vocabularies to help them understand basic and deeper material. Our action research question became: What effect will a diverse vocabulary instructional program have on vocabulary usage by secondary learners in mathematics and English? Our goal was to find out how we could make our vocabulary instruction more effective for all students by using researched, best practices.

Our settings were in a small, k-12 building with approximately 420 students total, where 50% of the students are on the free or reduced lunch program; the second setting was in a rural, alternative school that maintains about 150 students a year grades 8-12+.

Our first group of participants (Rebekah's) included two 10th grade English classes composed of 21 students total. Of these 21 students, two were on Individualized Education Plans, one was a foreign exchange student, and one was repeating the course as an 11th grader. In the English classes, there were seven male students and 14 female students. In Amanda's Math classrooms, there were 13 students in the Algebra 1 course; six of these students were on IEPs and two had modified curriculum. Of these 13 students, there were four females and nine males. In the Geometry course, there were 11 students; five of these students were on IEPs and four had modified curriculum. Of these 11 students, there were six girls and five boys.

When we began our background research, we wanted to include multiple intelligences somehow and find ways to engage students with their learning with research-based strategies. We also knew the benefits of teaching multiple-meaning words and how there are different meanings in different subject areas, especially in Mathematics, where a plane is not an aircraft, it is something much different. We also had been trying to incorporate Latin and Greek root words, prefixes, and suffixes in our instruction, primarily in the English classroom, but it was not connected to relevant words we were studying, so the process of memorizing them all was not necessarily effective. So in our literature review, we identified many strategies and attitudes regarding vocabulary instruction that influenced our thinking and how we wanted to teach vocabulary during our research portion.

What we learned first was directly related to our student populations, so it was of the utmost importance to us. We learned that low-income families tend to expose their children to far fewer words and less complex sentence structures than middle class

parents. This difference shows up in early assessments as smaller vocabularies for the low-income students and much larger vocabularies for the middle-class students. At 4th grade, many low-income students begin declining rapidly in achievement and it only becomes worse as they get older if no intervention is done. It is possible that with no effective intervention, the high performing students may know up to four times as many words as the low performer. Therefore not teaching vocabulary explicitly contributes to widening the achievement gap (Hirsch, 2003). As English and Mathematics teachers, meeting standards and trying to close the achievement gap is a definite goal, and it became evident to us that vocabulary instruction must play a part.

We also learned through our research that many vocabulary instructional approaches are based on minimal exposures to a word, which is largely ineffective (Beers, 2003). Additionally, many basal reading systems used in schools fail to immerse students into words study, and rather give students a superficial, disconnected experience with words that they are intended to learn. These systems do not begin with rich content and expose students multiple times and in different contexts to new words, but they do give students random, trivial literature to basically fill up time allotted for reading instruction (Hirsch, 2003).

What we learned through our research was not all doom and gloom, however. One fact we found to be reassuring is that according to Hirsch, (2003), in a study done by researcher Isabel Beck, “it is proven that students can learn 400 words per year when taught them explicitly,” (p. 16). That is a lot of words that students can be learning and integrating into their existing vocabulary each year! We also found that there are some great resources and strategies for teachers to use when developing vocabulary curriculum.

Some common threads between most of the strategies include: previewing and reviewing words, repeated exposures, breaking words into parts, and using multiple contexts and experiences to assimilate the new words into existing vocabulary. The use of graphic organizers, and other creative applications, such as visual, musical, and kinesthetic connections, were all mentioned as ways to teach vocabulary in a dynamic way.

According to noted researcher, Robert J. Marzano, (2009) teachers need to research proven strategies and experiment with these strategies in our different settings to determine their effectiveness across various settings, which is what we began to do in our research. We learned both practical strategies to use in our classrooms as well as fundamental knowledge that will continue to shape our attitudes when we approach new words and concepts in our classrooms. In our next section, we will describe what we did in our study in more depth.

Description of Research Process

The timeline for our research we estimated to take around six weeks initially, which ultimately became longer. Our original timeline for student involvement lasted from March 18th- May 3rd, but it ended up lasting about a week to a week and a half longer for both of us. Rebekah completed her focus group the week of May 13th, and it originally had been scheduled for the week of April 29th.

Our data collection sources were varied and included: a pre- and post- survey, teacher observations and reflections, pre- and post- assessments of students, and a student focus group. We began our research in March by having students complete a survey (see Appendix A) which addressed general student attitudes about the importance of learning vocabulary and what works for them as a learner. Rebekah had 12 students complete the

survey online using the free website, www.surveymonkey.com, and Amanda had 18 students complete the survey using pencil and paper.

Next, we each began with a pre-assessment for our students. Rebekah was beginning a unit focused on vocabulary from the novel, *The Great Gatsby* by F. Scott Fitzgerald, and gave students an assessment with 36 questions total (see Appendix B). The assessment included matching, multiple choice, true and false questions, and also visual representation questions. Students were given the assessment before any explicit instruction was given on the 36 words that were going to be the focus of the unit. There was also a knowledge rating scale included in the assessment where students were asked to rate their knowledge of certain words as either Know Word Well, Have Seen or Heard Word, or Don't Know Word at All.

Amanda's pre-assessment (see Appendix C) for her Algebra 1 class working on a unit on graphing linear equations and functions consisted of 13 words and for her Geometry class (see Appendix D) working on a unit on surface area and volume consisted of 18 words. Amanda added a few words from the next lessons in both classes in order to prepare for both units and to broaden her selection of words. Both pre-assessments were matching and the students were not given any information before they took the pre-assessments

After we collected pre-assessments, we began to incorporate our new instructional strategies for vocabulary development. Each of us decided to focus on a limited number of words for students to learn fully. Rebekah focused her instruction on four words per chapter for the novel, *The Great Gatsby*, which ended up to be 36 words total, and Amanda focused on eight words through the course of each unit in two different classes, so 16 words total. We also both focused on revisiting words frequently throughout the units, by looking at the words, discussing the words, and playing games with the words.

If the words are essential to the day's lesson, they should be reviewed quickly at the beginning of the lesson and left in a good place for reference throughout the day and duration of the unit (Bay-Williams, & Livers, 2009). Research has documented that one-time exposure to word meanings, or essentially informal teaching of words, is not enough for students to truly learn the word and embed it into their existing vocabulary (Jenkins et al., 1984). We wanted to make sure to thoroughly expose students to the words we were teaching.

One of the strategies that we both incorporated was using graphic organizers with students as a learning tool and way for them to strengthen and deepen their connections with words. Graphic organizers provide students with a way to really grasp the word meanings by representing their knowledge and connections with the words. Kyleene Beers (2003) mentions using a vocabulary word "tree" to explore root words and how other words are formed from this particular root. Beers also advocates for the use of graphic organizers to deepen student thinking and understanding about words and also as a way to use reciprocal teaching.

Amanda used a graphic organizer (see Appendix E) called The Frayer Model, which uses four areas to focus on different aspects of a word including: student definition in their own words, examples, nonexamples, and facts/characteristics of that word. This particular organizer was designed by Dorothy Frayer and her colleagues at the University of Wisconsin (West Virginia Department of Education, n.d.).

Rebekah used a few different graphic organizers which also had 4 areas for the students to work in. In the Verbal and Visual Word Association organizer (see Appendix F), students write the word, then its definition, make a connection to the word, and also

draw some representation of the word. In the vocabulary cluster organizer (see Appendix G), students determine a definition in their own words, synonyms, antonyms, and also examples from various contexts.

In addition to the graphic organizers, Rebekah challenged her students to move beyond worksheets and had them create visual representations of words, concrete or abstract, skits, and songs using the words. Students worked on the visual representations individually, and then shared with the large group. For the skits and songs, students worked in small groups and then shared with the large group.

As a way for us to both review the words with students, we played games with students before the final tests on the units. Amanda's students created their own crossword puzzles using words from the units. Rebekah's students engaged in vocabulary bingo and completed a crossword puzzle; both of these games included all of the words from the unit.

When we finished up our units, we revisited our pre-assessments, this time as post-assessments which were summative in nature. Rebekah's post-assessment was delivered as a component of the final for *The Great Gatsby*, but it was the same format as the pre-assessment. Amanda's incorporated the eight vocabulary questions from each class into their unit test as either true or false, fill in the blank and multiple choice questions (See Appendices H and I). These questions were accompanied by the mathematics problems that they needed to be able to answer.

To close our research, students reflected once again upon vocabulary and its importance by taking the same survey students completed at the start of our project. Rebekah also selected eight students to participate in a focus group about what activities

they did in the research project and what their thoughts were. The focus group included and took place during one class period. Students wrote their answers on paper and then discussed as a large group, oftentimes building off of each other's answers.

Throughout the implementation of our new strategies, we both documented our observations using journals, photographs, and video. We took comprehensive notes to reflect on student engagement and what we noticed as students were working through our new additions to the vocabulary component. In the next section, we will examine our findings more closely. We will also analyze our survey results, pre- and post-assessments, and take a look at what feedback the students offered in the focus group session.

Analysis of Data

Our data collection sources included a pre- and post- assessment, teacher observations of students, a focus group, and a survey. In this section, we will examine each source carefully and make connections and reflections.

Our first source, our survey, was administered at the beginning and end of our research. What we learned was that there was some shifting in student attitudes about learning vocabulary and its importance (see Table 1). There was more of a shift for Amanda's students, and possibly this is because she is teaching Mathematics, where students might think vocabulary is irrelevant. Mathematics is often associated with purely numbers, and not words, but words represent all of the fundamental concepts of Mathematics, so students must master this vocabulary in order to be successful. Many students know that vocabulary is important to them as adults and successful people. They recognize that words make up our world and that they need to know them. What

they do not necessarily recognize is that it takes some work to master and incorporate these words into our existing vocabularies.

For Bekah's students, most of the survey results increased, where student attitudes about vocabulary and its importance became stronger, except for the two last items. For context clues and root words abilities, student attitudes went down. This is definitely correlated with the fact that we did not incorporate these items as much as we had initially intended to.

Table 1
Survey Results

Survey	Average Student Response 1=strongly disagree 5=strongly agree			
	Initial Survey		Second Survey	
	Amanda	Bekah	Amanda	Bekah
I understand most of the words used in class.	2.78	4.00	3.67	4.10
The words I learn in class will be beneficial in the future.	1.94	3.67	3.00	3.90
A well-developed vocabulary will lead to higher success in school and in life.	2.56	4.00	3.06	4.50
Vocabulary instruction is important across content areas (Math, English, Social Studies, etc.).	2.33	3.50	3.17	4.50
Repetition of words is beneficial when learning new words.	2.56	4.17	4.06	4.40
Using a word in different formats (song, dance, drawing, etc.) helps with understanding a new word.	1.67	4.17	3.17	4.60
Learning new words in enjoyable.	3.11	3.25	3.61	3.70
I am confident in my ability to use context clues to determine an unfamiliar words meaning.	2.17	3.83	3.11	3.70
I can apply knowledge of root words, prefixes, and suffixes to determine an unknown words meaning.	3.00	4.08	3.17	3.90

Once we had gathered some initial data about student attitudes regarding vocabulary through the survey, we moved on to what students knew about the specific words we were working with. The pre-assessment for Bekah was a 28 question quiz and also a knowledge rating scale. The students' performance on the quiz portion was less than average; the median score was: 13 correct out of 28, and the scale indicated that of the 8 words given, students knew 14% of the words well, 45% of the words they had seen or heard before, and 41% of the words they had no clue about. Students also did not perform well on the visual representation questions at all; most students could not draw any representation for the words at this point.

Amanda's pre-assessment was a straightforward matching quiz that included 18 words for her Geometry unit and 13 words for her Algebra 1 class. Students performed like they would on any new information that has not been previously taught: not that well. Scores were in the low to low-medium range. For both of our pre-assessments, students were not primed or prepared with any information. It was strictly an exercise in prior and existing knowledge so we could truly see our results in the post-assessment.

Once we had collected our pre-assessments, we moved onto our instruction. We had each focused on a limited number of words for our students to master in our units. We both began our new strategies by incorporating graphic organizers into our instruction. Amanda used the Frayer model and noticed that her students were not happy about using the Frayer model for their vocabulary; they said that it was too much like elementary school. Luckily, once we started using it and they realized that they were using their own words for the definitions and that they could write whatever was going to help them remember the definitions of the words, they were less defiant about using them. In fact,

one time I forget to tell them to write it down on the template and they reminded each other and did it all on their own. Using this model became second nature for Amanda's students.

Because Bekah had more words to work with, she experimented with a few different graphic organizers. The first model she used was called a Vocabulary cluster, where students wrote the word in the middle with its definition, then brainstormed 3 antonyms and 3 synonyms for the word. At the bottom of the graphic, students came up with 3 examples in 3 different categories (person, thing, animal) that connected to the word somehow. Students worked well with this particular model. They used the Dictionary app on the iPads to help them think of synonyms and antonyms. They used each other's ideas to think of examples. This organizer provided a way for students to discuss the words with each other and to help expand each other's understanding of the words. Some students had very personal responses and examples that will serve as good connections for them as they recall these words.

Another organizer, the Verbal and Visual Word Association, was also effective for Bekah. In this model, students write the word, its definition, a visual representation, and also a personal association or characteristic. This model worked well for students who are visual learners. Many students took a long time brainstorming an accurate visual representation to complete their map. The personal association aspect was a good way for students to really own the word. Students were engaged with their thought process and with the meaning of the words when they used the graphic organizers. There were times where students were bored with the organizers, and I think they need to be used with discretion, and as part of a variety of strategies for students to learn words.

Students in Bekah's class also took a more informal approach to learning their words in a few different activities. First, students were able to only draw the words, and focus in on creating something more colorful and meaningful for them visually. When students did this, they sat in a circle and could draw concrete or abstract drawings of their words. When they were finished, they shared their drawings with the whole class. This was effective as a way for students to see other students' ideas and it also sparked more discussion about words.

Bekah also had students work in groups to create songs and skits about their words. Students took all 4 words from a chapter and were responsible for creating songs or skits to share with the class. During this part, students were engaged and having fun thinking about ways to use the words in original ways that would also show their understanding of the words. We had some good laughs from some of these activities. One group, in its representation of the word *corpulent*, acted out Santa Claus, and this will stay with many of the learners for some time. What happened with some of the songs and skits was that we remembered the words because we laughed and can recall what a certain student or group of students did to show us their words. When we reviewed for our final test, students revisited these skits and songs. We also videotaped the performances on the iPad so students could watch them at any time. For interpersonal and kinesthetic learners, these activities worked well. It also worked to have groups doing some reciprocal teaching.

After we worked with the words using graphic organizers and other strategies, we prepared students for the final assessments. We both tried to repeat and review the words throughout the units, but we focused on them all at the end of the unit again. Amanda's

students created crossword puzzles; they really enjoyed making the crossword puzzle for their review. They had to use all the words from their pretest and they could add up to 5 other words that did not pertain to the lesson. I have never seen my students so happy to use a dictionary in math class before. They were trying to see who could find the longest words to use and also the “weirdest words”. It was so nice to see them excited to learn. Bekah’s students completed a crossword puzzle, which they loved. Students enjoy crossword puzzles as review tools in my classroom. For logical learners, these games work well. Bekah also played vocabulary bingo with her students, and she included 25 words on each board, with 5 different boards. Students quickly realized which words they did not know as they played this game. In the future, Bekah will need to revamp the bingo game for it to be more successful; probably fewer words on a board would help. What happened was that students weren’t getting Bingo’s, so the game lost its competitiveness, which makes it exciting. It took too long for our first Bingo. Nevertheless, students were engaged and reflecting on which words they didn’t know. Before the final test, students referred to their comprehensive list of words for further review.

After our instructional period, we completed our post-assessments. There was definitely growth for students. For Bekah’s post-assessment question portion, the student average was 78% correct (see Figure 1). Bekah’s students performed much better overall, and students were now able to represent the words visually in those 2 questions. Students performed the lowest in the matching section, where some words have slightly similar meanings and threw students off. On the knowledge rating scale, students knew 54% of the words well, 38% of the words they had seen or heard before, and now only

8% of the words they had no clue about. There was definite growth in the students. (see Figures 2 and 3).

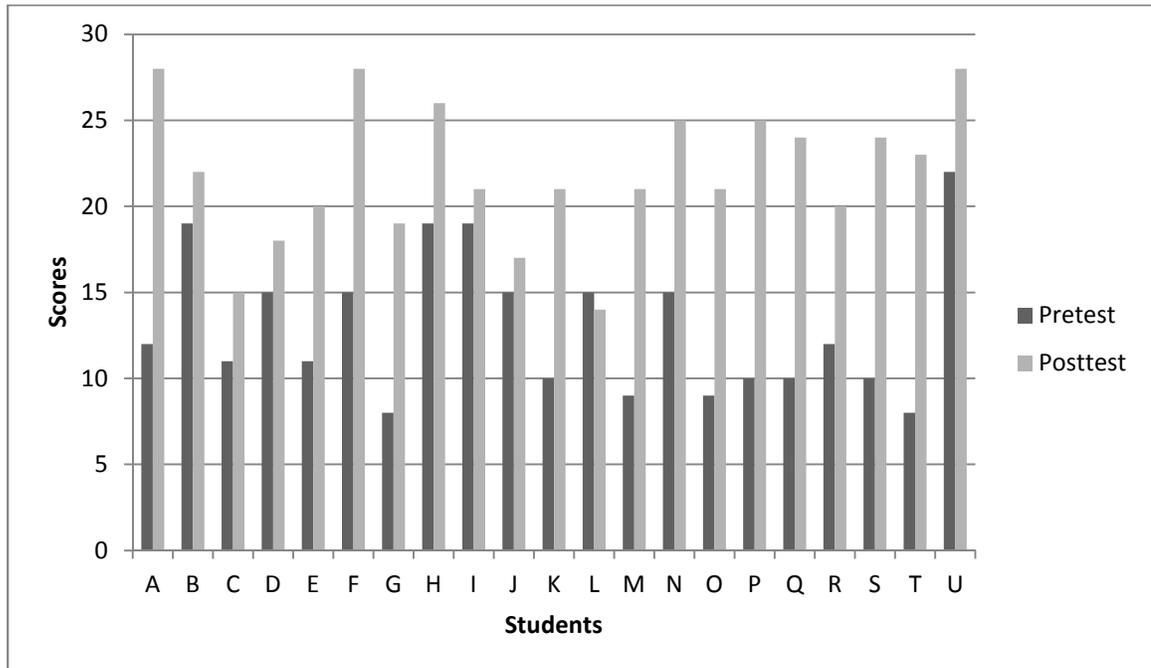


Figure 1. Bekah's student growth

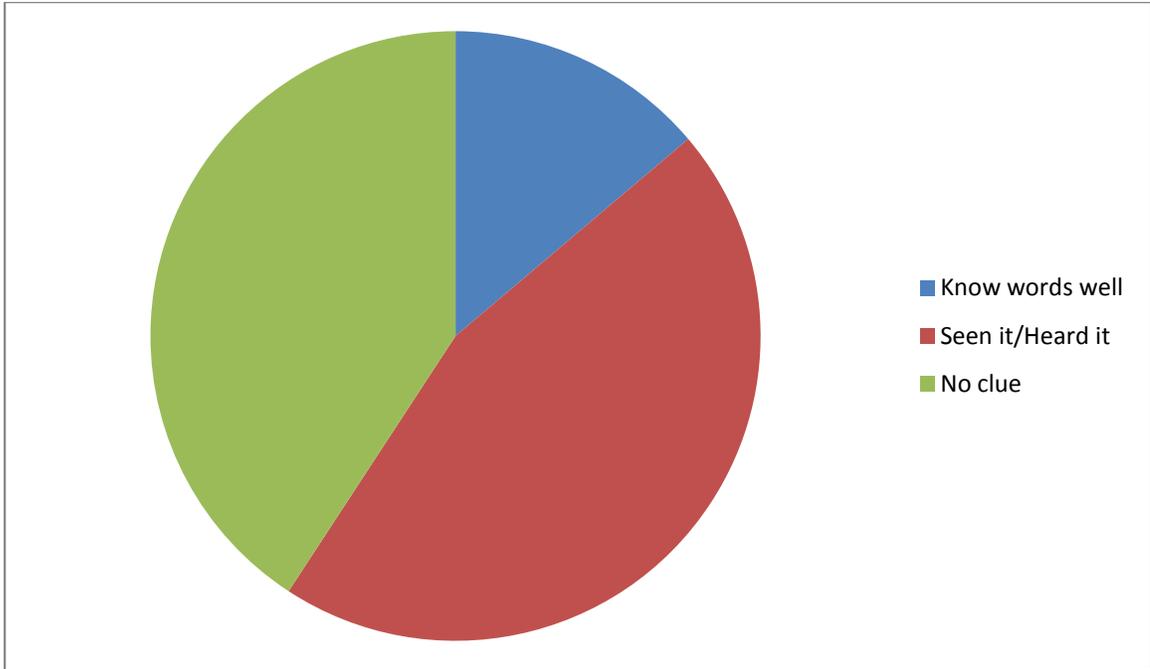


Figure 2. Bekah's pre-test knowledge rating scale

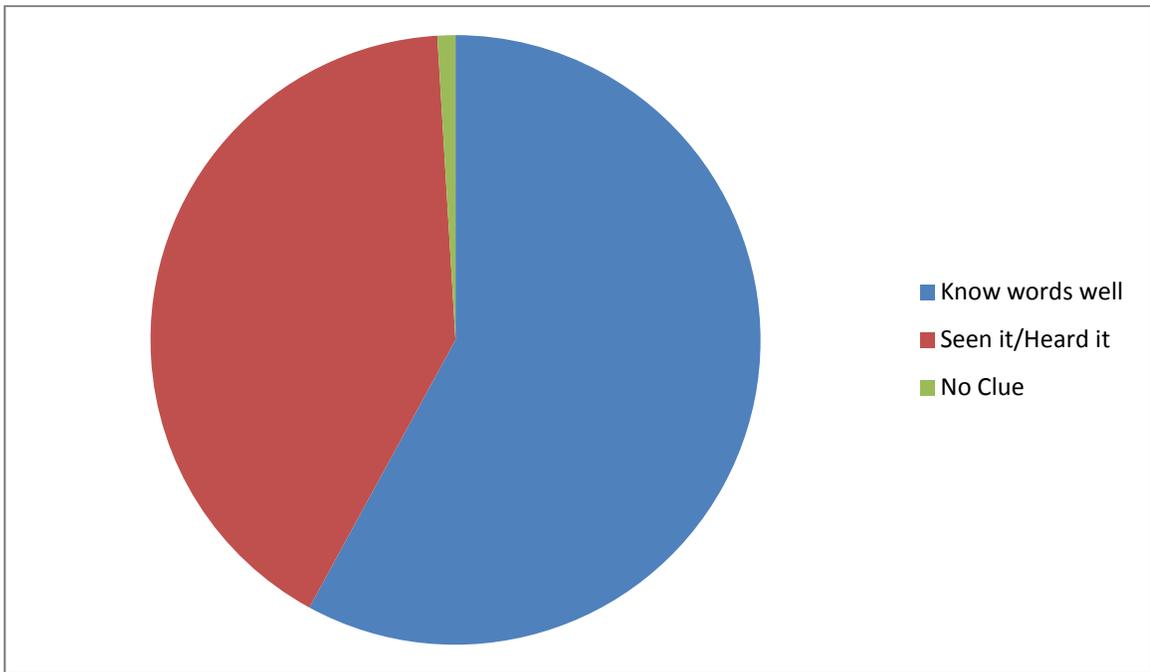


Figure 3. Bekah's post-assessment knowledge rating scale

Amanda's post assessment results also indicated student growth. (see Figures 2 and 3). In the post-assessment, no students got 0 correct, only one student was below passing, and many students were getting almost all of the words correct. There was also a relationship between their knowledge of the vocabulary words and their performance on the rest of the test. There truly is a link for Mathematics students between their knowledge of vocabulary and their performance on related problems and work.

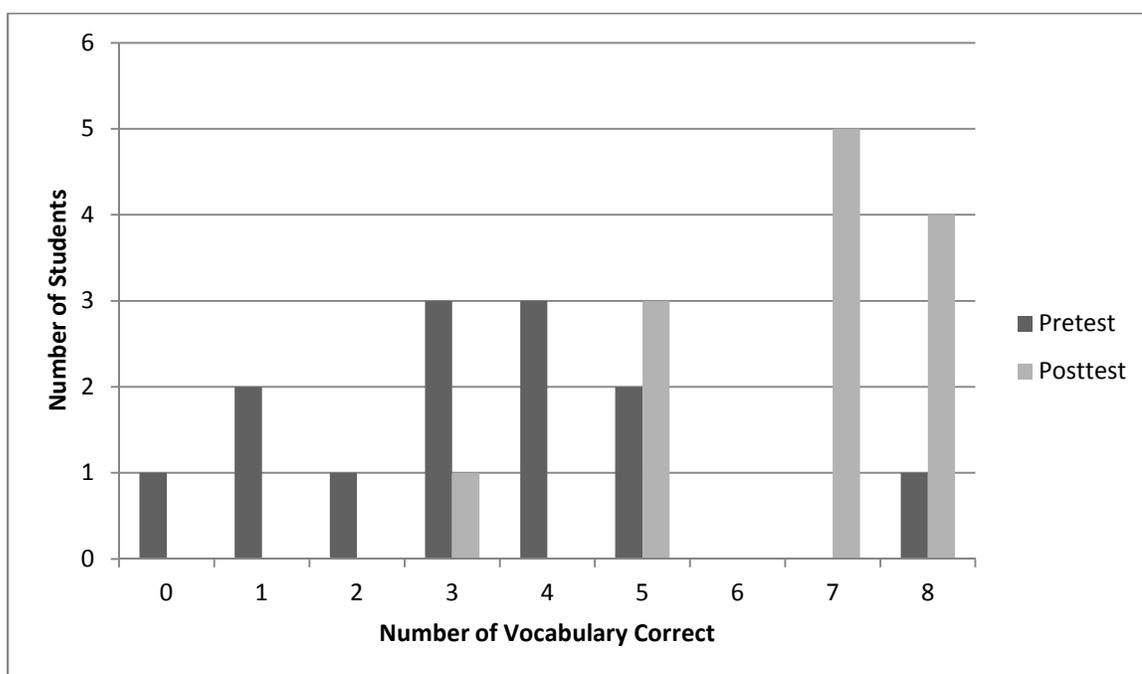


Figure 4: Amanda's Algebra 1 students

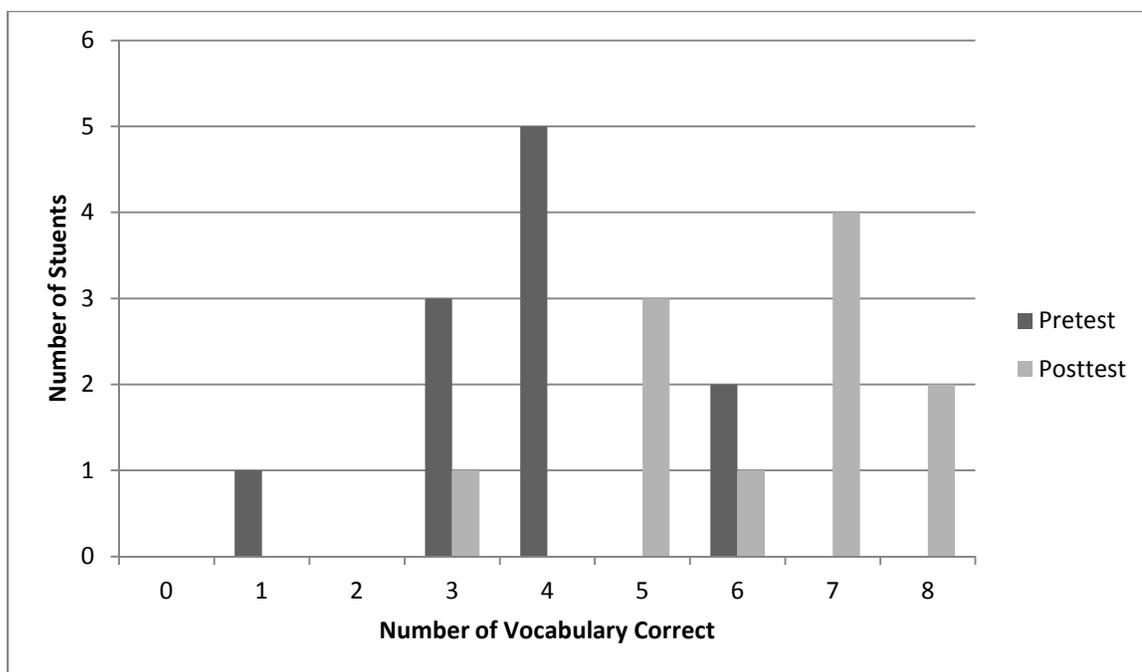


Figure 5: Amanda's Geometry students

The final component of the data collection portion was Bekah's focus group. Bekah performed her focus group on May 16th during 5th hour, which is right after lunch. The group was made up of three boys and four girls. Of the three boys, one is on an Individualized Education Plan, and of the girls, one is a foreign exchange student. The format of the focus group was that students answered eight questions on paper first, and then students participated in a round table discussion of their answers. Students also watched the videos and looked at the photos from their activities and refreshed themselves on the various activities they had completed as a part of the project. A few different themes emerged during the focus group. Firstly, students stressed the importance of learning new words to their success in the future. They also said that experimenting with different activities and strategies helped them learn the words more fully; just writing the words or copying them down isn't effective. Finally, students said

that they need these strategies to be present in other classes as well to help build their vocabulary across content areas.

Overall, our research showed that students need rich experiences in order to truly learn words. They need variety and repetition of words and associated concepts. In the next section, we will reflect on what we will do differently in our classrooms and what we learned that we will keep on using. We will also reflect on any possible variables that may have influenced the outcomes of our research.

Action Plan

We learned a lot about our students and our teaching through our research project. We definitely saw growth in our students, which was our goal. They learned new words using different, more dynamic strategies. We will both continue to implement many of the strategies that we used in our plan. Each of us will explain what we will do with vocabulary in our classrooms in the future based on what we learned from our research.

First, though, there are some considerations to be made as we reflect on our project and the results. One aspect of our study that may have impacted results was the time of year. We performed our study during the spring of the year, which can be hectic. Bekah's students were involved in MCA testing in the lab for both Reading and Science, which impacted her schedule and also created added stress on some students, thus affecting performance in class. Another spring phenomenon in many classrooms is that there are many sports that leave early during multiple days in a week, so attendance becomes more of an issue. Many of the same students missed some of the in-class activities that we did, and therefore did not receive the same level of instruction for their vocabulary as did other students.

Another component of our study that was not done according to our initial expectations, was our student survey. Especially for Bekah, her students did not all complete the online survey, which meant that there were fewer results than there could have been, so there was not a similar segment being surveyed as there were for the other parts of our research. We still collected adequate data, but they were not quite completed as fully as we had hoped.

For Bekah's classroom, she plans on using all of the different strategies that she used during the research: multiple graphic organizers, drawing, song-writing, and skit-writing. With these strategies, she does plan to make some adjustments. For example, the graphic organizers need to be done sparingly and opposite of other activities so that there is variety. Also, Bekah plans on using the graphic organizers more intentionally for discussion promotion activities, where students share their ideas with each other more and get further contexts for the new words. When using the song-writing activity, she will provide students with a popular or well-known melody for the students to use as a starting point, rather than just saying "go write a song with these words." She will continue with the drawing component and skit-writing as they worked well, especially for increasing student engagement and critical thinking.

Also, to help with the students who are absent and to add a technology and online component, perhaps Bekah will videotape the class sessions with vocabulary activities and put them online for students to view and complete online. Then these students will still receive the rich instruction that their peers received, so it will be more fair to them and to the process.

For Amanda, this action research project has changed the way that she will introduce and teach vocabulary. Her students were engaged and seemed to enjoy what we were doing, even

though it was just another way of taking notes. The graphic organizer helped students who do not normally gain as much from traditional lectures because they were able to take ownership of their work and use a more visual form. Their scores went up considerably and the students that have typically struggled with vocabulary saw the biggest increases.

Amanda will be sharing the graphic organizer that she used with other teachers so more students can benefit. The best part is the students already know how to use it so the teachers will not have any extra work to do. This should improve students' vocabulary through all subjects and maybe it will intrigue them to learn more difficult words that they are not required to learn for a class.

Amanda is always amazed at how her students are passionate about things that they enjoy and things that help them do better in school without requiring as much effort as they thought it was going to be initially. Amanda has thought about taking it a step further and asking each student to come to class one day a month with a new word that they heard and do not exactly know the meaning of. We will then, as a class, look up the word in different ways and each student will fill out the graphic organizer for that word. This will help the students not only learn that word, but become more proactive with increasing their vocabulary on their own.

What we both noticed throughout our action research project was that our students were more engaged in their thinking processes about the new words we were introducing to them. They had fun using the organizers and creative processes to apply their new knowledge of definitions and to help integrate the definitions into their existing knowledge base. Because we researched vocabulary and its importance for students, particularly low-income students, we will both remain committed to improving our instruction in this area with the ultimate intention of closing the achievement gap and helping students grow academically.

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