

Action Research Project 2002-2003
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The urban biology classroom was bustling with activity. The students were performing a lab concerning cell structure. Devon and Theresa were looking at their lab sheet as if it were from outer space. “What is a chloroplast?” Theresa asked. Her teacher replied, “It is defined in the reading on your lab sheet and it even has a picture.” Devon grabbed the lab sheet and yelled, “ Why do we have to do this stupid stuff anyway? I hate science!” If this scenario sounds familiar, then perhaps your students are frustrated because they cannot read for content information and hate your class as a result. Since test scores of our middle school and high school students are on the decline in both the sciences and social studies, I plan to implement a reading program in my science classroom that would change student attitudes toward the subject and improve the retention of content information as well.

Scientific information is hard to read due to the many new words students must learn along with each new concept. To understand the process of photosynthesis, for example, a student must understand chemistry, cell structure, and cell processes. Each of these concepts comes with copious vocabulary words. Furthermore, science textbooks cannot be read like a novel. The reader must process information as he/she reads. Each sentence is linked to prior knowledge and reads like an instruction manual. I believe that if students are taught how to read science in a less threatening fashion, then they will read with understanding and therefore change their negative attitudes.

Since science content is so difficult (and test scores reflect this problem), then I want to implement a Sustained Silent Reading Program to change attitudes as well as test scores. If students can choose what they read, their interest is already engaged. Brain research indicates that if one can link subject matter to prior knowledge, then new connections will be made in the brain, hence learning occurs (Marzano & Pickering, 1997). If a student finds relevance to his reading, then he will be more likely to read more often, feel better about the subject, and make vital connections necessary for retention of the information. Finally, the student's attitude will change in a positive direction.

This Action Research Project will answer the question: Will my student's attitudes toward scientific information improve, if I implement a student selected Sustained Silent Reading (SSR) program?

Review of Literature

Before I present my review of literature, I must define a term that will be used throughout my paper. Sustained Silent Reading is a program that allows students to select a book or article and read silently during class time. The teacher is also a participant in the activity of reading. This program has many names and abbreviations; however, I will refer to it as SSR. Due to my implementation of a type of SSR as my treatment for my study it is important to understand the concept of the program, as well as my deviation from the original SSR model. I will allow my students time in class to read silently. The students will select an article from a scientific magazine housed in my classroom. The choices include the following: *Popular Science*, *National Geographic*,

Sierra Club, Scientific American, World Wildlife Foundation, and Zoo. I will further define SSR and answer the following questions in my review of the literature.

What is the nature of science reading content?

What are student attitudes toward reading science content and scientific subjects?

What is Sustained Silent Reading?

What are the successes and failures of SSR

What is the nature of science content information?

Scientific information has traditionally been considered as difficult to read and comprehend. Reading science text is not simply a process of translating printed symbols into meaning, it involves the interaction of the reader's prior knowledge, beliefs, concurrent experiences, and the text in a socio-cultural context, to construct new meaning and understanding. (Spence, Yore, & Williams 1995) The Spence, Yore, & Williams study used a single group pretest/posttest case study design to gain an understanding of how the intact classroom was shaped by their teacher and the text. The teacher used explicit instruction of the text from a constructivist viewpoint. Explicit science instruction is embedded, long-term, and multifaceted. It includes domain knowledge, topic knowledge, science reading, science text, and specific science reading strategies. It is based on habits-of -mind goals and utilizes a limited number of powerful and diverse teaching strategies. Each teaching strategy must promote meaningful understanding of

content and be implemented for a long period of time. With explicit instruction even low-level ability readers and males gained in reading comprehension. The results illustrated the impact that explicit instruction has on science reading ability. (Spence, Yore, and Williams 1995)

Laura Chavkin, in her research on readability of science textbooks, quoted statistics that cannot be ignored by science educators. These statistics are in existence due to the very nature of scientific information. Scientific information is difficult to comprehend because reading it depends so heavily upon prior knowledge. The following statements will support this premise: The dropout rate in science courses accelerates as students enter high school. Women, minorities, and disabled persons have a low participation rate in science courses and careers. Only 7 percent of high school seniors are prepared for college-level courses in science (Chavkin, 1997).

Chavkin's study also examined the readability of high school science textbooks in biology, chemistry and physics in the state of Texas. The findings were reinforcing to the idea that science content is difficult. Only 50% of the biology texts matched grade level reading ability. Both chemistry texts and physics texts were written on the college level. If chemistry and physics are taught in the 11th and 12th grade, then not very many students can understand the text material. As for the biology text, most biology students are 9th or 10th graders and have an average reading level of 8.5 years, while most biology texts are written on 10th or 11th grade level. Chavkin points out the need for science teachers to know the readability levels of their textbooks so that they can select the most appropriate ones for their students (Chavkin, 1997).

A study that examined how high school biology teachers describe their instructional use of science reading and textbooks emphasizes the difficult nature of science content (DiGisi and Willet 1995). Quantitative analyses confirmed a strong association between the amount of textbook reading assigned by teachers and the academic level of the class taught. Teachers were asked on a questionnaire how frequently they used their textbooks for four purposes: to assess how well students are able to read the textbook; to preview the lesson; to reinforce the lesson; or to have students learn information independently. All teachers are the least likely to use the textbook to assess reading skills. Teachers of basic-level students were more likely to use the text for reading assessment than any other academic level. Teachers of basic-level through honors levels all used to text to reinforce the lesson but did not use the text for independent student learning. Advanced placement teachers used the text almost exclusively for independent student learning. Probably the most interesting finding of this study is that even though biology teachers viewed both reading and inquiry activities as important to learning subject matter, they appeared unsure of how to incorporate reading comprehension strategies into their science instruction (DiGisi and Willett, 1995).

Karen Ostlund of the University of Texas at Austin did a historical study of “What the Research Says About Science Process Skills.” Her research supports the idea that scientific information is difficult to read and comprehend. Science can be best understood by “doing science,” also referred to as “hands on science.” Through experimentation and inquiry, students can improve their reading and writing skills and internalize the concepts of science as well. If science is linked to other subjects, then students can succeed from the skills learned in all areas (Ostlund, 1998).

Carol Lloyd of the University of Nebraska at Omaha studied the practices of two teachers and how they used the textbook in their curriculum. One teacher was a constructivist and used the inquiry labs and ancillaries to supplement the text. The second teacher was a behaviorist and believed that the text was the authority, and he strictly used the text and little else. This qualitative study underscores the need to examine the culture of classrooms in order to understand how students learn and become literate within a discipline. Observations from the constructivist classroom showed student learning to be at a more advanced level than the student learning in the behaviorist classroom. This result demonstrates the power of teachers' beliefs about teaching, students, text, and subject area. (Lloyd 1996) Lloyd's study brings to mind the quote by Mary Futrell, "We teach who we are" (Mary Futrell, 2001). Teachers utilize instructional strategies based upon their own values, beliefs and attitudes.

Since, historically, the text has been used as THE PRIMARY means of knowledge acquisition, educators must improve the students' understanding of the content within the text. (Flanagan, 1996) Flanagan in an analysis of Jean Cibrowski's book, Textbooks and the Students Who Can't Read Them, outlines three phases for success in reading comprehension. The first phase is called "before reading or head start". In this phase, the teacher sparks student interest by activating prior knowledge and by focusing on the purpose of reading. The second phase is called "during reading". During this phase, the teacher uses techniques such as reciprocal teaching, which involve questioning, clarifying, and modeling. The third phase is called "after reading" may involve a number of activities. The teacher may go over vocabulary or have students give examples of good writing and bad writing within the chapter. Finally, the teacher may

have students read as recreation about topics that are related to the textbook. “We need to more actively engage our students in the learning process at every possible opportunity--- before reading, while reading, and after reading in order to increase their comprehension and long-term retention” (Cibrowski, 1993).

Scientific information is difficult to comprehend and is based upon prior knowledge. The research suggests ways to teach science content information explicitly with success. The strategies for teaching science content are varied and shaped by the teacher’s beliefs, attitudes and values. Constructivist teaching seems to produce better results than the traditional methods. By linking science to prior knowledge, making it relevant to the student’s life context, and using habits-of –mind teaching strategies, teachers can improve reading comprehension.

What are the attitudes of students toward reading in general and reading science specifically?

Independent reading and writing habits of students have remained relatively stable across all age groups since 1984. Also, between this time period, there was an increase in the number of 9th grade students who reported reading for fun almost every day. In 1994 those students who reported reading for fun almost every day had higher average reading proficiency scores than students who reported never or hardly ever reading for fun. Also, 1994, the types of materials students read both at home and at school varied. For all ages, students reported having recently read a science, social studies, or math book in school than at home, while they reported most recently reading magazines more at home than at

school. (The United States Department of Education, 1997) Apparently, it depends upon the environmental context in which the student is reading as to the subject matter that is being read.

A study done by Jane Kendrick utilized research that indicated successful readers have several common characteristics. They have student choice, available reading materials, time for reading, and time to talk about their reading. This study focused on 7th grade students in a small southeastern city, as well as their teachers' reading practices. The results of the study were interesting. Excluding textbook assignments, the majority of boys surveyed did not read and did not enjoy reading. Teachers and parents encouraged students to read, but fewer than half engaged in reading to boys. Teachers did not provide a time for personal sustained silent reading during the school day. Middle grade boys did not read unless required by their teachers. Finally and not surprisingly, assigned reading materials were not the preferred reading material of middle school students. (Kendrick, 1999)

Research has shown that reading ability is positively correlated with the extent to which students read recreationally. (The United States Department of Education, 1997). Cynthia Gettys and Frankie Fowler conducted a study confirming this idea. Their study "The Relationship of Academic and Recreational Reading Attitudes School Wide: A Beginning Study" collected baseline data which measured student attitudes toward reading in academic and recreational settings. It also determined if reading attitudes in academic and recreational settings changed over time and investigated whether differences in attitudes toward reading exist between grades or when students were grouped by sex. Qualitative analysis demonstrated that all students felt that they

were readers and that they enjoyed reading. Findings suggest that the school environment as well as the classroom environment and the experiences that the students had with real life literacy played an important role in producing this positive attitude toward reading. In their summary, the researchers discuss the importance of reading for enjoyment. They give suggestions for teachers to facilitate this new attitude “the joy of reading”. Teachers must not only provide a variety of reading experiences outside the classroom but during class time as well. They must supply students with an environment that is conducive to reading enjoyment. This environment includes student selection of reading material, an opportunity to share their knowledge in a non-threatening manner, and a setting that is relaxing for the reader. (Gettys and Fowler, 1996) (Everett 1987)

Tricia Stevens action research project “Motivating Students To Read” is the application of all the premises of reading research. Her study uses motivational strategies to increase student enjoyment of reading and to foster a life-long love of reading. The target population consisted of primary and middle school students from three different urban midwestern schools settings. The fact that students were not motivated to read was documented through parent and student surveys, observation checklists, and student interviews. The strategies chosen for the study included lending libraries in the classroom, national incentive reading programs, backpack book activities, and Drop Everything and Read. After the interventions were made, the analysis of data indicated an increase in student’s motivation to read and to choose reading as a leisure time activity (Green; Kandyba; McDonald & Stevens, 2000.)

What is Sustained Silent Reading (SSR)?

Lyman Hunt at the University of Vermont proposed sustained silent reading in the 1960's. (Gardiner, 2001) Over the years it has been given many names, such as DIRT (daily independent reading time), DEAR (drop everything and read), USSR (uninterrupted sustained silent reading), SSRW (sustained silent reading and writing), POWER (Providing Opportunities with Everyday Reading) or simply SSR (sustained silent reading). What ever it is called it is a powerful tool to help students develop into lifelong readers. (Hopkins, 2001)

Sustained silent reading, as it was designed by Hunt, is a time of silent reading which has common guidelines that insure success. Students should read silently every day, choose their own books, have uninterrupted time to read, be able to choose not to finish a book, observe the teacher modeling good reading habits, and not be required to take tests or write book reports on what they read. (Gardiner, 2001)

To assure the success of a Silent Sustained Reading program, it is important to establish an understanding of the guidelines. Once students are aware of the program, the teacher and the students must list the rules and adhere to them. Melanie Dully mentions five rules to read by in her study "The Relationship between Sustained Silent Reading to Reading Achievement and Attitude of the At-Risk-Student." The rules are simple:

- 1) Each student chooses his/her own book.
- 2) Students silently read during a scheduled time period without interruption.
- 3) The whole class reads silently together.
- 4) The teacher also reads silently and does not allow interruptions.

- 5) No assignments should be given. Written reports or questions will turn off the students from reading. (Dully, 1989)

Not all SSR programs are the same. Some use the Hunt model strictly, while others adapt their programs to suit a specific purpose. The primary goal of the Hunt model is to increase students' enjoyment of reading. Gardiner sites a researcher who investigated the connection between sustained silent reading programs and attitudes toward reading and found that daily reading opportunities improved attitudes. (Gardiner, 2001) In some schools, individual teachers include sustained silent reading as part of their programs. In other schools, SSR is adopted school wide. No matter the form it takes, SSR is a powerful tool for improving student attitude as well as reading skills.

What are the successes and failures of SSR?

Out of ten articles I reviewed concerning SSR programs, only two mention failure. This failure was due to study design rather than to the concept of SSR itself. “A Survey of Sustained Silent Reading Practices in Seventh-Grade Classrooms” is a study done to ascertain the prevalence of SSR in classrooms and the degree to which the program's original goals are being met. It showed a failure of SSR to accomplish the goal of promoting reading enjoyment. Ninety-six teachers from 32 school districts in five northeastern Pennsylvania counties were sent a survey regarding participation in SSR, organization of the program, material selection, and methods of evaluation. Sixty-nine teachers responded to the survey. Findings suggested that silent reading is popular in the classroom because of the opportunities for instructional decision-making it provides to

the teacher. The individual implementation of the program has led to serious deviation from the original model. This deviation from the Hunt model has caused the original goal of reading enjoyment to not be attained (Nagy; Campenni & Shaw, 2000).

The second article suggesting failure of SSR is “Support for Reading in Middle and High School: Institutional and Organizational Influences” written by Sunderman, Amoa, and Meyers, 1999. This study was done to understand the capacity of middle and high schools to support reading. The study found that most middle and high schools have limited resources and expertise to support a successful reading program. Middle schools and high schools have adopted a limited number of strategies aimed at improving the literacy skills of their students. The factors of limitation include limited funding, scheduling, curriculum requirements, few teachers with reading expertise, and lack of appropriate materials. The most adopted practices to address these limitations were reading and writing across the curriculum and sustained silent reading. The use of SSR as the only means of addressing literacy would be disastrous. The study states that the students’ gains in literacy were due to high quality instruction at all levels and not the SSR program.

Most of the research is extremely positive toward SSR and supports it as a tool for improving self-concept, attitude and reading comprehension. The study by Lee-Daniels and Murray is an account of how a first year elementary teacher used DEAR to improve her reading scores. Lee-Daniels believes that the best reading practice is to read. Avid readers improve their reading fluency, acquire new vocabulary, absorb knowledge of the world, and even heighten their intelligence. (Cunningham and Stanovich 1998) Lee-Daniels implemented a program in her classroom, against her principal’s wishes, to

improve reading scores. She allowed students to select their reading material, allowed them to share with a buddy and used a bulletin board for reinforcement. Students' recreational reading improved due to the intrinsic rewards system she used with SSR. Student's self-esteem, peer concern, and morale increased not only in reading class, but also, throughout the day. Intrinsic motivation is crucial because it works from within the student for long-term achievement. "To become lifelong learners, children need an engaging curriculum; safe, caring communities, and a significant degree of choice about what, how and why they learn the skills needed for growing." (Lee-Daniels and Murray 2000)

Akmal suggests a modified form of SSR that focuses on reading time in class and regular meetings between students and the teacher to help middle school students read. Students contract with the teacher to read books of their own choice. Terms of the contract are number of pages and how much time is needed to complete the book. The teacher then has periodic conferences with the student to assess progress. Conferences help develop the academic and non-academic self-concept of students.

"When middle school students control their learning experience and receive teacher support, they are more willing to put full effort into their work. An ecological approach, such as, contract-and conference-based SSR, offers teachers and students that opportunity."(Akmal 2001)

Two other middle school studies sing the praises of SSR. Terry Norman author of "Accountability strategies for reading" uses SSR in her 7th grade classroom. She asks her students to give a 15-second summary at the end of a reading period of what they are currently reading. The 'buddy read' system encourages shared reading. Journal

writing, visits to the library and teacher modeling have made SSR a success with her students. (Newman, 2000) A second middle school study “Independent Reading in the Sixth Grade: Free Choice and Access to Material” indicated that 48% of teachers surveyed in Orange County Public Schools reported that independent reading is a significant part of their reading program. However, of those teachers who were practicing SSR in their classrooms almost half had to provide their students with material to use during reading time. This lack of resources was noted and suggestions to improve the funding for reading materials were made. The more resources available for use in the program the stronger the effects of SSR.

The use of SSR is not only for middle schools. High schools are using it all across the nation. Kimberly Gutchewsky teaches English at a high school in St Louis, Missouri. Her article in the English Journal describes her action research conducted in her own classroom. She used a SSR program to teach novels. She allowed students to choose their own novel. The students and the teacher read for 40 minutes per day. She had student- to- student book talks once per week. Students were put into groups do discuss the books they were reading. This places accountability upon the student as well as the teacher. The students also kept reaction journals, prepared projects, and answered reader response question throughout the semester. The results of her study were noteworthy. Seventy percent of the students said they like to read now or have always liked to read as long as they’re reading what they like. Twenty-six percent said they hate to read. Her favorite reactions were those students who said that they like SSR because reading was “better than work.” (Gutchewsky, 2001)

Another high school based study was conducted in Texas by Mary Ozburn.

The interesting thing about this study was that all the participants were Hispanic. Ozburn implemented an SSR program to improve her student reading test scores. She used traditional SSR format however, she used teacher conferencing and authentic performance-based assessment. Students never saw a grade only written comments from the teacher on their papers. There was no textbook used for the course, only library books. Over 2000 books were checked out over the time of the study. This is quite an accomplishment for 60 students. All students improved in their reading level. The average grade level improvement was 3.9. The least improvement was 1.5 by 3 students who did not read outside of class. Eleven students improved 5 grade levels, 17 improved 4, 22 improved 3, and 7 improved 2. There was a high correlation in improvement number of books read and amount of reading done away from school. “The success of this program was validated recently by a note left by a substitute teacher. He wrote, I’m sorry, but I couldn’t get your students to read the story and answer the questions. They wouldn’t put their books down. They were real quiet, though.”(Ozburn, 1995)

The strongest support for SSR comes from a teacher who has been using it at the high school level for the past 20 years. Steve Gardiner teaches English and Journalism at Billings Senior High School in Billings, Montana. He implemented an SSR program in his class over 20 years ago. He began by setting aside time for his student to read in class every day. He conducted surveys about their reading habits and attitudes. He learned that students who read frequently on their own had better literacy skills and better grades. Also, if students were allowed to read in class they found books they enjoyed and looked forward to reading. Many students start before the tardy bell rings. Gardiner also noticed

that sustained silent reading improved reading speed and comprehension. “ I have received many letters from former students commenting on how the sustained silent reading program changed their reading habits, their literacy skills, and their attitudes toward reading and school.” This comment from one of Gardiner’s seniors summarizes his success. “Silent reading helps me relax and escape from reality. Every night before I go to bed now, I read 15-20 pages. I used to hate reading, but now it’s starting to grow on me. It helps me move on through life.” (Gardiner, 2001)

The review of literature suggests that Sustained Silent Reading programs can improve attitudes toward reading by encouraging reading for pleasure. This technique seems to have far reaching benefits such as improvement in reading comprehension, and even the reading level and reading speed of students of all ages and ethnicities. SSR programs can break the barriers between the student’s preconceived attitudes toward the difficulty of science reading content and the acquisition of scientific information. Students who are given the freedom to read what they choose are empowered to read with proficiency and enjoyment.

Methodology

Introduction:

As stated previously, this action research project was a result of my frustration to motivate students to read science content information. Many of my students not only hate to read , but they hate reading science content. Scientific information is difficult by nature. I believe that if I give them opportunity to read scientific information by choice, then their attitudes may change toward science content.

Setting:

This action research project was conducted at Fulton High School, a nine through twelve institution. Fulton High is an urban school located in a large city in Tennessee. The population of the Fulton community is predominantly Caucasian and blue-collar working class. The student population is 74% Caucasian, 24% African American, 0% Native American, .002% Asian American, .02% Latin American. Fifty-three percent of the student population is receiving free or reduced lunch. Twenty-seven percent of our student population is receiving special education services. Our enrollment is currently 929 students. We are on the block system for class scheduling. Students attend four ninety-minute classes per day. Students can earn four credits per semester. Many of our students work during the school week to supplement family income.

Participants:

Participants of this study included 13 students from an Ecology class. Four of the students were seniors and nine of them were juniors. Two of them were Hispanic, two were African American , and nine were Caucasian.

Three students were special education students, and ten of were regular education students. There were six males and seven females. According to the research of both Ozburn and Gardiner, Sustained Silent Reading works well for many different ethnicities and ability levels. Since there was such a wide range of both ethnicity and ability within the same classroom this class seemed to be the perfect climate in which to implement SSR.

Action:

This was a study utilizing qualitative research methods of data collection. A pre survey and post survey (Appendix 1), student interviews (Appendix 2), and student journals were the tools of data collection. Students and parents were given a letter of permission to participate in a teacher implemented action research project. I realize that this could be a threat to validity; however, I had to get permission for research by law. First, students were administered a pre-survey to determine attitude toward reading, reading habits, and attitude toward science content information. Students were allowed to select and read an article of their choice from one of the science magazines housed in the classroom one day per week for six weeks. The magazines available were: *Zoo*, *Scientific American*, *National Geographic*, *Sierra Club*, *World Wildlife*, and *Popular Science*.

After reading an article the student was asked to write a few sentences stating his/her feelings about the article in a journal. Also, once a week the students were asked to share any interesting fact or story they had read about. If the student did not wish to participate in the sharing he could pass with no consequences. After six weeks of SSR,

a post survey was administered and an interview was done for each student to assess attitude change.

Data Collection:

Students' attitudes were varied within this unusual mixture of students; therefore, to substantiate a change in attitude, it was necessary to design a tool to measure the change. The result was a survey of six questions that sampled student attitude toward reading and reading scientific information. A copy of the survey is Appendix 1.

The survey questions are:

1. How often do you read for pleasure?
2. When you read, what do you usually choose?
3. What is the topic that you most often read about?
4. What best describes your feelings about reading?
5. When you read your science textbook the content is.....
6. On the following scale rate yourself on your feelings about science.

After obtaining permission from the parents of my students, I administered the survey. The second week of the semester the surveys were distributed in the classroom and all 13 were returned. The students were asked to put their names on the survey sheet. The last week of the term, just before exams, I administered the survey to my students a second time. Also, a tape-recorded - post interview was completed by taking individual students out of the classroom setting for 10 minutes to assess attitude change.

(Appendix2) The interview questions are as follows:

1. Has your attitude toward science reading changed as a result of reading in class?
How?
2. Has reading articles from a science magazine affected your feelings toward scientific information? How? Can you give me an example?
3. How did you feel about having time to read something you chose during class?
Why?
4. What did you enjoy about reading time?
5. What did you not enjoy about reading time ?

Student journals were collected and read. The pre survey and the post survey are the same tool.

Data Analysis:

After the surveys were completed and collected, a quantitative approach was used to analyze all of them. The surveys were read multiple times to determine the number of responses to each of the questions. Then the pre surveys and post surveys were compared to see if any attitude change had emerged. Responses were tallied.

Conclusions were then drawn from the tallies. The student interviews were tape recorded, so that they could be transcribed and analyzed. Student journals were read to determine attitude change. Then the statements from the interviews and student journals were used to support the findings.

Findings

My research question was: Will my student's attitudes toward scientific information improve if I implement a student selected Sustained Silent Reading Program?

The Silent Sustained Reading Program that I implemented in my classroom was able to change the attitudes of two of my most unmotivated students who now read for pleasure and did not before. It reinforced good reading habits exhibited by the majority of my students who already read well and often. Finally, it helped my special education students who have a language impairment to succeed with difficult scientific information without fear of making a failing grade.

To support these findings we must examine the pre and post surveys closely. Since I had the students to put their names on each paper I was able to compare pre and post data more accurately. There were thirteen students in my Ecology class.

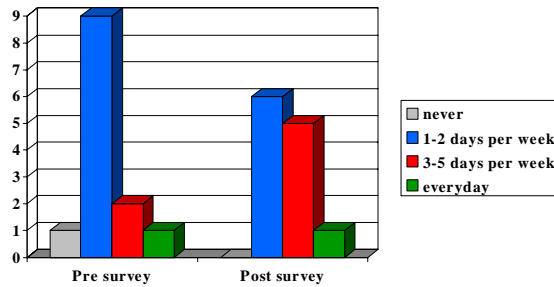
Question #1- How often do you read for pleasure?

Pre survey data: One student said he never reads. Nine students said that they read 1-2 days per week. Two students said that they read 3-5 days per week. And one student said that she reads everyday.

Post survey data: No students said that they never read. Six students said that they read 1-2 days per week. Five students said that they read 3-5 days per week.

And one student said that she reads everyday. This shows a change in that the student who never reads is now reading at least one day per week. Three of the students who read 1-2 days per week at the beginning of SSR are now reading 3-5 days per week.

How often do you read for pleasure?



Question# 2- When you read, what do you usually choose?

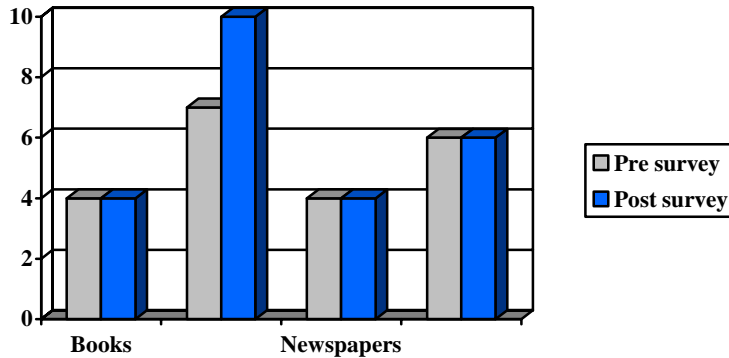
The students could circle all that applied from these choices: Books, Magazines, Newspapers, and the Internet. On the pre survey four students circled books.

Seven students reported reading magazines. Four students chose newspapers. Six students chose the Internet. In the Post survey four students chose books. Ten students chose magazines. Four students chose newspapers. Six students chose the Internet. It is interesting that before SSR seven students read magazines, and after SSR ten students read magazines.

Three students started reading magazines after SSR. Since they had been so vocal about not liking to read dumb magazines, I am sure that these three students developed an interest during SSR and now will continue reading magazines for information about topics of interest. Two of my male students discovered that Popular Science Magazine is

“cool” when they found articles about new car, motorboat, and motorcycle designs in them.

When you read, what do you usually choose?



Question #3- What is the topic that you most often read about?

The topics about which students chose to read reported in the pre survey and post survey were almost identical with the exception of three additions in the post survey of : animals, cars, and technology. I believe that these newly added topics were due to the nature of the types of magazines available to the students. *Popular Science* has quite a bit of technology related articles, while *ZOO* is strictly animal related. The topics are: love stories, weather, information about anything, news, fiction, wrestling, video games, sports, horror stories, dolphins, celebrities, teen stories.

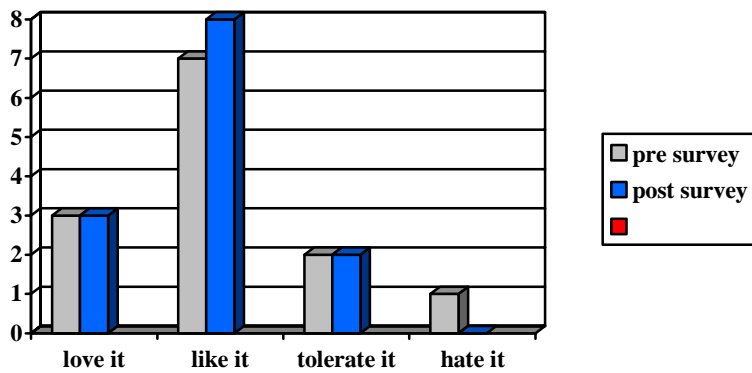
Question #4 What best describes your feelings about reading?

The students rated their feelings on a Likert scale ranging from hate it to love it.

On the pre survey three students said that they loved to read. Seven students said that they liked to read. Two students said that they tolerate reading. One student said that he

hated to read. On the post survey three students said that they loved to read. Eight students said that they liked to read. Two students said that they tolerated reading. And NO students said that they hated to read. This shows a change in one of my students who hated to read who now tolerates it and “really doesn’t hate it anymore.” This evidence is supported in the exit interviews and student journals.

What best describes your feelings about reading?

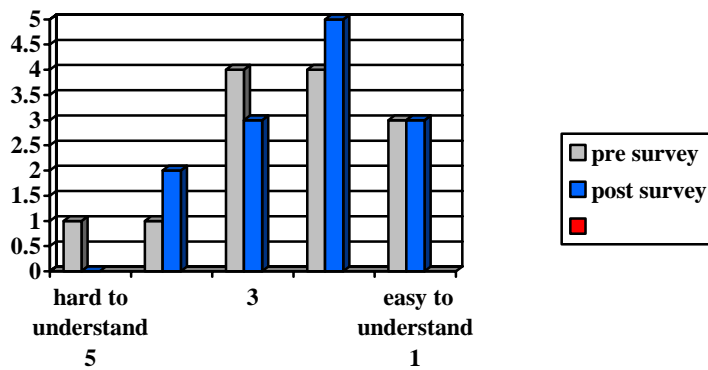


Question # 4 - When you read your science textbook the content is.....

Students again answered based on a Likert scale ranging from Hard to understand (5) to Easy to understand (1). On the pre survey one student said that the science text was hard to understand at 5 on the Likert scale. One student responded in the 4 range. Four students responded in the 3 range. Four students responded in the 2 range showing lack of difficulty in reading the text. And three students answered in the 1 range indicating that it is very easy to read the text. On the post survey, after receiving SSR, zero students responded in the 5 range indicating that one student no longer sees the science text as impossible to read. Two students responded in the 4 range. Three students responded in

the 3 range. Five students responded in the 2 range. Three students responded in the 1 range. It is significant that one student changed his mind about the difficulty of his science textbook. Also one student went from a 3 to a 2 that is an indication of added confidence in her reading skills.

When you read your science textbook the content is.....

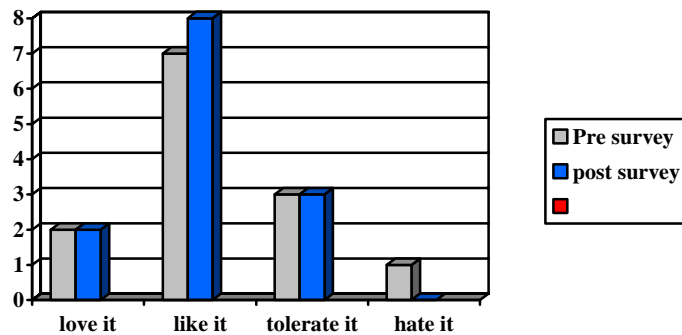


Question #6- On the following scale rate yourself on your feelings about science.

Students responded to a Likert scale ranging from love it to hate it.

On the pre survey two students said that they loved science. Seven students said that they liked science. Three students said that they tolerated science. And one student said that he hated science. On the post survey two students said that they loved science. Eight students said that they liked science. Three students said that they tolerated science. No students said that he or she hated science. This is significant because the student that despised science before SSR now tolerates it. This clearly is a change in attitude.

On the following scale rate yourself on your feelings about science.



Open Ended Interview Questions and responses.

1. Has your attitude toward science reading changed as a result of reading in class?

How?

- a. No. I like to read anyway.
- b. It didn't change much because I read all the time.
- c. I don't know.
- d. It didn't change.
- e. I like science anyway, but when I have time to read it I can understand it better.
- f. Yes. I learned new stuff.
- g. It was fun because I learned stuff.
- h. It bettered my reading skills technically because of the bigger words and longer sentences.

My best reader said that he had improved his reading skills. This was a pleasant surprise, because it substantiated the research of Cunningham and Stanovich (1998) that showed that SSR builds vocabulary and reading comprehension. Another

interesting finding was that my two Hispanic students truly enjoy reading English for the sheer pleasure of gaining new information. This is an unexpected result, which verifies the research of Ozburn (1995) that Hispanic students improved reading comprehension with SSR. Ozburn's students average improvement was 3.9 grade levels. Finally, my student who hated to read said he didn't know if it had changed his perception. I believe that this student still had a dislike of reading, yet he found out from SSR that some reading could be enjoyable and that was a new concept for him.

2. Has your reading articles from science magazines affected your feelings toward scientific information? How? Can you give me an example?
 - a. No. I love to read anyway.
 - b. Well, again, it didn't change.
 - c. Yes. I learned things I wouldn't have learned other wise.
 - d. I can learn more. But, it didn't change too much.
 - e. Yes, it helped me to accept science and look at it in a different perspective.
 - f. None.
 - g. It didn't really affect me.

An interesting finding here is that my non-reader said that he learned things that he would not have otherwise. Again there is evidence that student attitude is changed because one of my African American female students who was intimidated by the text said, "Yes, it helped me to accept science and look at it in a different perspective." I believe that the following statement from Cibrowski sums up this observation of change. "We need to more actively engage our students in the learning process at every possible

opportunity --- before reading, while reading, and after reading in order to increase their comprehension and long-term retention.” (Cibrowski, 1993,pg5)

#3 How did you feel about having time to read something you chose during class time?

Why?

- a. It's a better way. We like to choose.
- b. I liked having a choice.
- c. I loved it. I thought that it was good. We are more interested if we get to choose.
- d. It was hard to choose because there were so many articles to choose from.
- e. I think it is better to choose something you like to read because you don't get bored with it.
- f. It is a good idea.
- g. It gave me a better opportunity to read what I was interested in and that way I understand it better.

These findings were textbook support for the research of Lee-Daniels and Murray (2000), Cunningham and Stanovich (1998), Akmal (2001), Norman (2000), Gutchewsky (2001), Ozburn (1995) and Gardiner (2001) which state that SSR can change attitude, improve reading skills, and even reading comprehension.

#4 What did you enjoy about reading time?

- a. Well, it was quiet and I could concentrate better.
- b. I got to choose.

- c. I love to read about sharks.
- d. I liked share time best, because I learned about what everyone else read about.
- e. The thing I enjoyed most is to learn things.
- f. Articles about different things.
- g. Different types of articles not just all scientific but there were some different things.
- h. Getting to read what ever we wanted to read.
- i. I got to read about animals. I love animals!

Time and time again my students said that they enjoyed choosing their own topic to read. They looked forward to that opportunity every week. Once again as research suggests **student choice** is a powerful tool in changing attitude, improving reading skills, and even reading comprehension. (Green; Kandyba; McDonald & Stevens, 2000)

#5 What did you not enjoy about reading time?

- a. I can't say that there was anything about reading time that I didn't like.
- b. Nothing. I love to read.
- c. Having to write about and tell about it instead of only telling about it. I hate to write.
- d. So many articles to choose from.
- e. The time it took to read it.

- f. I don't like to read. I like to have someone read to me. It takes so long for me to read it and I understand it if someone reads it to me. If I get to read something that I want to, then I don't mind reading as much.

I learned here that I should have adhered to Melanie Dully's research, which warned not to pair writing with the SSR. I wanted evidence in the journals of my students that attitude was being affected, but the mere act of having them write almost undermined the SSR. If I had followed the Hunt model then, I would not have had this problem. Hunt will only allow students to read and tell. Writing throws another variable into the mix that can undermine attitude change toward reading.

There were three unanticipated outcomes from this action research project. First, I was able to change the attitude of one of my most difficult students from one of cynicism to one of acceptance. Because he was able to read about what he loved, water skiing, he began to enjoy reading magazines in class. At first he acted very reluctant to read in front of his peers. One day he stayed after class and said, "I hate to admit it but, I guess reading those magazines isn't as lame as I thought." Secondly, my pairing the reading with journaling and having the students share with the class was not such a good idea. Next time I would leave the journaling out. Students benefited from SSR and sharing with the class reinforced their learning of what they had read. Writing about their reading was stressful for them. SSR must be stress free. As mentioned previously, I should have paid more attention to Melanie Dully's (1989) advice in her research to never pair writing assignments with SSR. Finally, I had no idea that allowing my students a choice would have such a profound effect on their performance. They remembered things that they had

learned from their reading and related them, when appropriate, to the science subject matter. For example, when we studied about water pollution, one of my students shared that he had read an article about sharks and that he learned that water pollution was killing sharks off the coast of California. When we studied land use and land pollution, a student informed the class that she had read about the oil reserves in the Arctic tundra in Alaska. She told about the threat of land pollution that would result due to obtaining oil in an Arctic environment. These are only two examples of where the SSR helped my students to retain and correlate scientific information to their course of study.

Conclusions

Sustained Silent Reading is a powerful tool to change attitude, improve reading skills, and improve reading comprehension and retention. Before implementing this intervention in my classroom, I felt that SSR could possibly help my students to better accept science content. I was amazed that it not only changed attitude but also improved my students' ability to make connections from their SSR reading to the content of their Ecology textbook. (Marzano & Pickering, 1997) This is the outcome that I had hoped for. I wanted my students to view their science subject matter with a new perspective one with less fear and more willingness to learn. This intervention did just that.

All of my students liked having a choice of reading what they wanted too. Having the students to make their own choice as to what article they read seemed to empower them. By this I mean that they felt as though they could govern what went into their minds instead of me dictating their learning. In this instance, they became self-regulated learners. (Marzano, 1997) Most of them even enjoyed listening to what their other classmates had read about. Two of my most difficult students, when given a choice,

found that reading science was “cool”. Finally, my ESL students and Special Education students were able to excel at SSR because there were no grades attached. In reality, all of my students benefited from SSR. Those who loved to read, read with better understanding and built their vocabulary base. Those who hated to read, when given a choice changed their attitudes, learned new subject matter and built their vocabulary base as well.

Discussion and Recommendations

The strengths of this action research project must start with the concept of Sustained Silent Reading. This concept has been utilized by teachers for many years under different names: DIRT-Daily Independent Reading Time, DEAR- Drop Everything And Read, SSRW-Sustained Silent Reading and Writing, and POWER- Providing Opportunities With Everyday Reading. This concept was utilized almost exclusively by elementary school and middle school teachers; therefore, secondary educators were reluctant to try this strategy. I, too, was reluctant to try a strategy that my students were exposed to in the lower grades for fear that they would think that I was treating them like little kids. Much to my delight, my students loved the intervention and benefited from it in ways that I had not expected. SSR changed attitude, improved reading comprehension, and retention. For this reason, I would highly recommend its use at the secondary level. It is especially effective in the Basic level science classes.

Major limiting factors for using SSR with Gateway Biology science courses are time restrictions and rigid curriculum constraints. I was able to use SSR with my Ecology classes but not my Biology classes for this reason. To implement this strategy it

must be utilized at least 45 minutes once a week and preferably twice per week. Since the Gateway Biology curriculum is so rigid it does not allow the valuable time necessary to bring about changes in behavior due to SSR. The Ecology curriculum, on the other hand, lends itself to the use of SSR. There was ample time to both read and discuss the article of interest. The articles could be related more easily to the Ecology curriculum as well. For example, if a student read about the Exxon Valdez oil spill it is directly related to the Ecology curriculum concerning water pollution.

The next time that I use this intervention (and I will), I will change three crucial components. I will extend the time of my research intervention. I will not pair the student's reading with writing. I will broaden the scope of the magazines utilized for the SSR period. This time I limited the reading to only magazines that I provided: Scientific American, National Geographic, ZOO, and Popular Science. Next time I will have a wider array of choices for my students. The reason for this change is that I believe that the more choice that a student has the more profound the effect of the SSR. Also, next time, I will extend the intervention from six weeks to at least eight or even perhaps the whole semester. Attitude change requires much more time to have the desired effect. Finally, I will not pair their reading with writing. This puts too many variables into the mix and causes extra stress to the student. They feel as though they are being punished for reading. That is not at all what you want them to feel. In addition to leaving off the writing, I will have a more relaxed atmosphere in the room during reading time. The research shows that students excel in a relaxed environment with SSR.

I would highly recommend SSR use in secondary science classrooms. Especially, in those courses that do not have rigid limitations on time and curriculum. Ecology and

Earth Science are two that I feel would benefit from this intervention. SSR also is very beneficial to students with poor reading skills and poor attitudes toward reading. It seems self-evident that to improve reading skills one must read; however, secondary educators have missed this truth for years. It is time for us to go back to the basics teach them to read and enjoy the adventure.

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