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THE IMPACT AND EFFECTIVENESS OF STUDENT-CENTERED CLASSROOM
STRUCTURE

by

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STATEMENT BY THE AUTHOR

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THE IMPACT AND EFFECTIVENESS OF STUDENT-CENTERED CLASSROOM
STRUCTURE

Amie P. Westberg

The purpose of this paper is to explore the effectiveness of student-centered learning as
an alternative classroom structure. It is important that we continually reflect on our
teaching methods and explore alternatives that can help give our students the best chance
to succeed.
While the literature is mixed with regard to which classroom style is best, there are many
sources showing the benefits of student-centered instruction over a strictly teacher-
centered classroom. Sources also showed that teachers do not need to choose exclusively
one style of teaching, and that a blended classroom using a variety of teaching styles can
be very effective. This paper also explores why teachers are reluctant to implement
student-centered instruction into their classes, and some proven methods for dealing with
these issues.

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Chapter 1: Introduction

Throughout history, the traditional American classroom has placed the teacher front and center, feeding information to a group of students who are taking notes and "learning" the content of the lecture. However, the prevailing view from the government, business, and scientific community is that American education is failing to equip its children with the necessary skills and knowledge needed for economic survival (Matthews, 2001). This has caused many to consider whether our traditional classroom structure is really the most effective method of instruction.

There has been much debate in recent years over alternatives to the traditional "teacher-centered" classroom, with educators asking "What is the best way to teach our children to equip them for success in the world today." One alternative to the traditional "teacher-centered" classroom is a more "student-centered" approach. This approach is different from passive lecture techniques as it invites students' active participation in their learning and more directly involves the students in the problem solving process. This begs the questions of whether student-centered classrooms are an effective alternative to traditional classrooms, and what effect this teaching style has on student attitude and achievement.

I am interested in student-centered teaching due to my personal experiences in the classroom. It is obvious that each student learns differently, and a strategy that works for one student does not always work for all. I have also noted that different teaching strategies seem to work better depending on the content being taught. Learning new strategies and ideas will help me to implement them in my classroom and give each of my students the best chance for success.

Statement of the Problem

Considering our country's gradual decline in the ability to compete in the world's technological marketplace (Moffat, 1992), it is important that we evaluate our traditional methods of teaching and consider alternatives that may help our students succeed. This paper will analyze student-centered teaching as one possible alternative, and attempt to help teachers understand how and when to best implement these techniques in their classrooms.

Research Questions

This research paper will use current literature to answer the following questions:

1. What is student-centered learning?

2. Is student-centered learning more effective than traditional teacher-centered, lecture-style instruction?

3. Are there gender differences with regard to the effectiveness of each classroom structure?

4. Is student-centered learning an effective technique in classrooms with at risk students, minority students or students of low socio-economic status?

5. If student-centered learning is more effective for certain subjects or students, why don't more teachers incorporate it into their classrooms? What are some hesitations that teachers have with using a student-centered approach, and what solutions have been proposed to help teachers overcome these obstacles?

Significance of the Research Problem

A report recently published by Harvard University's Program on Education Policy and Governance found that students in Latvia, Chile and Brazil are making gains in

academics three times faster than American students, while those in Portugal, Hong Kong, Germany, Poland, Liechtenstein, Slovenia, Colombia and Lithuania are improving at twice the rate (Huffington Post, July 2012). The U.S. spent $10,498.66 on each public school student in 2009, according to the U.S. Census. The figure is as high as $18,126 in New York and as low as $6,356 in Utah. Considering that Utah has a higher graduation rate than New York, we see that this is a complex problem that cannot be solved simply by spending more money on schools. If funding is not the solution to America's lag in education, then we need to look at how we can improve our teaching strategies to help students succeed.

Gasser compared classroom practices in the United States to other countries, and found less high-level thought has been required of our students than other students around the world. He favors a more student-centered approach, allowing students to think through problems and invent their own possible solutions. This teaches students to organize and analyze information on their own before being given the answer by the teacher (Gasser, 2011).

Jim Barnett states that students are passive while teachers lecture, and that this passive state is undesirable for learning (Holt-Reynolds, 1991). Using student-based hands-on activities is one way to engage students and invite active participation in their own learning.

While teacher-centered classroom structure is certainly the most common format in today's schools, we as teachers need to look at including other teaching styles in order to engage our students and involve them in the learning process. Student-centered learning is one useful technique that can be easily incorporated in most classrooms.

Knowing how and when student-centered techniques are most effective will give teachers more confidence in using them in their classrooms.

Limitations and Assumptions

The research will focus primarily on the math and science classrooms. I am assuming that secondary teachers are open to new methods of instruction and are willing to incorporate new ideas into their classroom if research supports their effectiveness.

Definition of Terms

Teacher-centered learning – in this instructional approach, the teacher's primary functions are lecturing, designing assignments and tests, and grading (Brent, 1996). Teacher-centered instruction is a formal approach, where the teacher provides information that is passively received by the students (Baeten, 2010).

Student-centered learning – Collins & O'Brien (2003) define student-centered learning as an instructional approach in which students influence the content, activities, materials, and pace of learning. This learning model places the student (learner) in the center of the learning process. The instructor provides students with opportunities to learn independently and from one another and coaches them in the skills they need to do so effectively. The student-centered approach includes such techniques as substituting active learning experiences for lectures, assigning open-ended problems and problems requiring critical or creative thinking that cannot be solved by following text examples, involving students in simulations and role plays, and using self-paced and/or cooperative (team-based) learning. The teacher is seen as a facilitator of learning where students are permitted to move around freely, use of time is flexible rather than structured, and evaluation compares learners to themselves rather than to peers, with a deemphasis on

formal testing (Chall, 2000). Students are encouraged to think on their own and as a group, to actively seek answers to problems, rather than being given the solutions by their teacher.

Summary Statement

With the United States struggling to keep up academically with its global peers, educators are looking for ways to improve our methods of instruction and help our students to succeed. Student-centered learning is one method that has been used in certain classrooms in recent years. The goals in a student-centered classroom are aimed at helping students to actively seek answers to problems and to promote higher order thought processes. Knowing more about how and when student-centered learning is most effective will help teachers to more easily incorporate these ideas into their own classrooms.

Chapter 2: Review of the Literature

What is student-centered learning?

Student-centered learning may seem like a new idea to many educators, but the concept has actually been around for over a century. The concept of student-centered learning was used in the writing of educational scholars, researchers and journalists, as far back as the early 1900s (Chall, 2000). In her book *The Academic Achievement Challenge: What Really Works In The Classroom?*, Jeanne Chall clearly defines these two basic classroom types. In general, the teacher-centered approach is more formal, focusing on established standards for each grade level, in which the entire class is moved through the curriculum by teacher led activities (Chall, 2000). In contrast, the student-centered approach attempts to follow student interests as much as possible, integrating materials across subject areas. The teacher is seen as a facilitator of learning where students are permitted to move around freely, use of time is flexible rather than structured, and evaluation compares learners to themselves rather than to peers, with a de-emphasis on formal testing (Chall, 2000).

Another explanation of student-centered learning can be found in the Greenwood Dictionary of Education (Collins, 2003), which describes it as an instructional approach in which students influence the content, activities, materials, and pace of learning. This learning model places the student (learner) in the center of the learning process. The instructor provides students with opportunities to learn independently and from one another and coaches them in the skills they need to do so effectively.

Brent and Felder describe student-centered instruction as a broad approach that includes such techniques as substituting active learning experiences for lectures, holding

students responsible for material that has not been explicitly discussed in class, assigning open-ended problems and problems requiring critical or creative thinking that cannot be solved by following text examples, involving students in simulations and role-plays, assigning a variety of unconventional writing exercises, and using self-paced and/or cooperative (team-based) learning. (Brent, 1996)

Baeten et al. described student-centered approaches as ways of thinking about teaching and learning that emphasize student responsibility and activity in learning rather than content or what teachers are doing. Characteristics of these student-centered teaching methods are: (1) an activity and independence of the student, (2) a coaching role of the teacher, and (3) knowledge which is regarded as a tool instead of an aim. One recurring aim of these teaching methods is fostering deep learning and understanding, which can be expressed as a deep approach to learning. (Baeten, 2010)

Is student-centered learning more effective than traditional teacher-centered, lecture-style instruction?

There has been much debate throughout history about how to best educate our students. There is no shortage of opinion on this topic, but these opinions are not always backed by research. There are, however, some scientific studies and well-educated opinions on which mode of instruction is most effective.

In 1997, congress asked the National Institute of Child Health and Human Development to assemble a national panel to assess the effectiveness of different approaches used to teach children to read. In 2000, the panel concluded its work and released *The Report of the National Reading Panel: Teaching Children to Read.* The report indicated that instruction in phonemic awareness, phonics, and guided oral reading,

was of significant benefit to improving children's reading ability. The NRP report also found that explicit instruction in vocabulary and text comprehension was significantly related to improving reading comprehension (NICHHD, 2000). Taken in its entirety, the NRP report provides solid empirical evidence that teacher-centered approaches are clearly related to improving student reading performance (Matthews, 2001).

Jeanne Chall did an in-depth review of the history and research in American education of the 20th century, published in her book *The Academic Achievement Challenge: What Really Works In The Classroom?* Her goal was to understand the differences between student-centered and traditional teacher-centered approaches to education. In summarizing her extensive research on the two approaches, Chall found that the effects on academic achievement when combining a teacher-centered approach with student group work were generally found to be more effective than using strictly a student-centered approach (Chall, 2000). She found that learning in groups and incorporating teacher led instruction leads to higher achievement than individualized student-centered learning. Most of Chall's research centered on students in the elementary grade levels, as she found very little data comparing the two educational approaches at the secondary level. She speculated that the higher achievement effect when using a teacher-centered/group work approach would be predicted to be greater at the primary level since the elementary grades focus on skill acquisition and the secondary grades focus more on reasoning and problem solving.

Another author (O'Neill, 2005) wrote about the dangers of focusing completely on the individual learner in a student-centered classroom, and how in some cases this does not take into account the needs of the class as a whole. The author points to the

uniqueness of each child, and how using a single teaching style in any classroom is dangerous due to the learning needs of each student.

It seems that for every article or study touting the benefits of teacher centered instruction, there are several additional articles or studies discussing the benefits of student-centered classrooms.

An article by Shymansky and Penick (1981) looks at how teacher behavior affects student performance in activity-centered science classrooms, at the elementary and junior high levels. The study found that activity-centered classrooms encourage student creativity in problem solving, student independence, and help low ability students overcome initial handicaps.

An article by Bredderman (1984) analyzed the effects of activity-based programs on student outcomes in elementary science classrooms. He performed 57 controlled studies in over 900 classrooms. He found an average improvement of 20 percentile units on science process tests for students in activity-based programs over those in other programs. This improvement was significantly greater for disadvantaged students and less for advantaged students.

In 2008, Wolfarth surveyed graduate students in student-centered classrooms at a small liberal-arts school in the Southeastern United States. She found that the student-centered approach contributed to the students feeling respected as learners, developed their critical-thinking skills, and encouraged their self-directedness (Wolfarth, 2008).

A study by Baeten (2010) looked at factors that encourage or discourage the adoption of a deeper approach to learning in a student-centered environment. The results were extremely variable from study to study. The authors concluded based on their

mixed findings that influencing students' approach towards deep learning by means of implementing student-centered learning environments is a complex process. They felt that there are most definitely other factors that encourage or discourage adoption of a deep approach to learning, and that simply implementing student-centered instruction does not guarantee students' deeper learning.

Lonka and Ahola (1995) performed a 6-year study on psychology students, comparing traditional and a more student-centered approach. Students felt that they developed better study skills and understanding in the student-centered classes. Students who took more student-centered classes did better on exams and in thesis writing. The students who participated in more student-centered classes were slower in their first three years, but were more successful in the long-term.

Another study found students in student-centered classes had increased participation, motivation and grades. In addition, the same study reported that 94% of the students would recommend student-centered learning to others over the teacher-centered alternative (O'Neill, 2005).

Yet another study investigated higher education students' perceptions of and attitudes toward student-centered learning. The students felt there was more respect for them in this type of classroom, and that it was more interesting, exciting, and it boosted their confidence (Lea, 2003).

Are there gender differences with regard to the effectiveness of each classroom structure?

Nancy Moffat did a study in 1992 that looked at how classroom structure can affect each gender's attitude toward science classes. In her research, Moffat found that

classroom structure emerged as a powerful correlate of attitude towards science. In general, she found that students in student-centered classrooms had somewhat of a more positive attitude towards science than those in teacher centered classrooms. Individual student attitudes, both male and female, decreased as students perceived their classrooms to be less student-centered and more teacher-centered. However, females overall preferred teacher centered classrooms and were more likely to reject science as a future career in student-centered classrooms. Males preferred student-centered classrooms. Moffat commented in her study that females may dislike student-centered classrooms in general due to the typical female role within groups. She felt that females may be doing more of the writing and recording activities, while males may be doing more of the actual investigating and hands on activities within groups.

Patrick Sullivan did a large study of gender differences in an online, student-centered college level environment. He found that male students appear to be more comfortable working independently than their female counterparts. Not a single male student mentioned self-discipline or self-pacing as a negative, while 10% of female students felt this was a negative aspect of the class. (Sullivan, 2001)

A study by Lynna Ausburn looked at the value applied to certain aspects of a blended online course for male and female college students. The study found that females gave high value to having a sense of 'belonging' or involvement in a group, while males were much less concerned with these aspects. Females valued face-to-face work as a group, while males did not feel this was as valuable. (Ausburn, 2004)

Montgomery and Groat showed considerable evidence that many women tend to approach learning in more "connected" ways, meaning a style that emphasizes empathy, collaboration, and careful listening. (Groat, 1998)

Quing Li (1999) found gender to be one of the most significant predictors of faculty teaching models, studying various grade levels from elementary through college. Particularly, she found that female teachers tended to promote learning environments that are more student-centered. Also, she found that female teachers appear to use class discussion more often, encourage collaboration and affective learning techniques rather than more traditional instructional behaviors.

Is student-centered learning an effective technique in classrooms with at risk students, minority students or students of low socio-economic status?

Sarah Lubienski did a small study in the early 1990s comparing the learning styles of different socio-economic groups in 7th grade math classes. She found that students of low socio-economic status (SES) were resistant to learning math through problem solving and open discussion; these students preferred that the teacher "just explain how to do it" or asked the teacher to "tell me the answer". In contrast, their higher-SES peers had the confidence to make sense of the problems for themselves; they found the discussions about conflicting mathematical ideas to be interesting and informative (Lubienski, 2007).

A mathematics professor at the University of California-Berkely in the 1970's named Uri Treisman established a group-based, student-centered calculus program for at-risk minority students (Treisman, 1990). He found that 56% of African-American students in this group earned a grade of B- or better in the first year calculus class,

compared to 21% of the African-American students in teacher-centered first year calculus classrooms. In addition, only 3% of students in the student-centered group dropped out of calculus, compared to 25% in the teacher-centered group, and four times more of the students in the student-centered group graduated with math majors than in the teacher-centered group (44% compared to 10%).

Brent and Felder (1996) discuss another study done by a college professor named George in 1994, who tested several cooperative learning techniques on a predominantly Aftrican-American psychology class and compared their performance with that of a control group taught non-cooperatively. She found that group work led to significant improvements in both academic achievement and attitudes toward instruction.

Felder et al. (1995) report a study of cooperative learning in a sequence of college engineering courses. Women responded to group work with overwhelming approval, but many indicated that they tended to assume less active roles in group discussions and some reported that their ideas tended to be devalued or discounted within their teams. The likelihood of these occurrences was reduced if a team contained more than one member of the minority population. They concluded that teachers should try to avoid groups in which the minority students are isolated.

Banks (1988) reviewed studies on cognitive, learning and motivational styles and how they are influenced by ethnicity and social class. He found that African-American and Mexican-American students are more likely to prefer cooperative group work where they are working with others to achieve common goals.

If student-centered learning is more effective for certain subjects or students, why don't more teachers incorporate it into their classrooms? What are some

hesitations that teachers have with using a student-centered approach, and what solutions have been proposed to help teachers overcome these obstacles?

Zoltan studied the resistance to student-centered learning in the Korean education system. He found that the most likely reason for resistance in this setting has to do with teacher respect and authority. He finds that the average Korean educator is used to the great level of authority and respect teachers are afforded in Korea's teacher centered classrooms. He feels it may be difficult for Korean educators to give up their control on education and the respect that comes with the territory (Zoltan, 2009). In this setting, he does not feel changes will come easily as the problems are deeply rooted in Korean educators' strict, traditional ways of thinking.

Diane Holt-Reynolds (1991) conducted a study of preservice teachers. The preservice teachers were given actual scientific evidence of the benefits of student-centered classrooms. They were also shown evidence of the limitations of traditional lecture style classrooms. The teachers were then surveyed as to whether they planned to run a student or teacher centered structure in their own future classes. Most of them accepted small-group, peer-led discussions as occasional additions to traditional formats, but no one regarded them as appropriate substitutes for traditional teacher centered lecture formats. Holt-Reynolds went on to survey the preservice teachers as to why they came to these conclusions, and discovered that their answers were based on their own personal history-based beliefs of what a classroom should look like, and they were ignoring the evidence-based proof that a student-centered approach is more effective in many cases. One of her recommendations for influencing these preservice teachers is that professors need to expose the strengths and limitations of referencing personal

experience as a data source and challenge them to be open minded in their thought processes.

Brent & Felder point out that some teachers may be concerned about not getting through their syllabus if they spend too much time on active learning (Brent, 1996). They report that teachers who incorporate student-centered learning do not have to spend a lot of time on in-class work to have a significant impact. They advocate starting with short student-centered exercises mixed in with traditional lectures at first. They have found that adding one or two short student-centered exercises (totaling 5-10 minutes a day) can be quite effective and significantly enhance learning.

Another major concern is with teachers who try student-centered learning and report that many of their students hate it or refuse to cooperate with the activities (Brent, 1996). Brent & Felder have found that instructors who set out to try student-centered learning in a class for the first time are often unpleasantly surprised by the fierce negativity of some responses. To minimize this resistance, they recommend that teachers try to persuade the students from the beginning that you are neither playing a game nor performing an experiment, but teaching in a way known to help students learn more and understand better. They recommend showing the students how these classroom experiences can apply to real-life situations, such as telling students that when they enter the workforce they will be expected to work in teams. They also recommend using the medical example of "see one, do one, teach one", where doctors report that they only truly learn something after teaching it to a colleague – which is the same concept that occurs during student-centered group activities.

A common concern for teachers regarding student-centered or cooperative learning activities is that lower-achieving students will "hitchhike", getting credit for work done in which they did not actively participate (Brent, 1996). This is a very real danger, according to Brent & Felder. Johnson, et al. advocate using cooperative learning that includes provisions to assure individual accountability – such as tests on the material in the group assignments (Johnson, 1991). They have found that students who don't actively participate in the group work will generally fail the tests, especially if the tests truly reflect the skills involved in the assignments.

Brush and Saye noted that teachers are often ill equipped to manage student-centered activities, and don't understand their role as a learning facilitator in a student-centered classroom. The development and implementation of student-centered environment within a classroom requires different roles and responsibilities for teachers. Because of this, teachers often provide too much structure for students, or no structure at all and totally disengage themselves. Better education and preparation on the part of the teacher, as well as collaborating with their peers, can help them to implement student-centered learning more effectively (Brush, 2000).

Brush and Saye (2000) suggested ways for teachers to deal with the lack of structure and students feeling overwhelmed in student-centered classrooms. They found that students particularly needed more structure at the beginning of a student-centered unit, when they tended to feel lost and overwhelmed. They suggested that the teacher take time initially to discuss the goals, strategies, questions and responsibilities before they begin working on their own. They felt that goal setting and pre-assessment of knowledge prior to starting a new task was helpful. They also found that introducing

several smaller student-centered activities prior to implementing a larger unit would help to provide students some experience dealing with these types of problems and help them to be more successful.

Brush and Saye (2000) also encountered students who had difficulty managing their time efficiently, monitoring their progress, and identifying areas where they needed assistance. In their case study, the students felt rushed at the end of their data gathering activity and required extra time. The authors recommended that teachers monitor each student's progress daily and give feedback on their work, especially when they first introduce their students to this type of learning environment. This can help students to learn time management skills and accountability over time.

Another helpful strategy is for teachers to implement student-centered learning as an entire faculty, in all classes, as opposed to a single teacher. This would allow teachers to provide each other with peer support and sharing of ideas. This would also help students to be more engrossed in the student-centered environment and get more used to this method of learning. (Brush, 2000)

Chapter 3: Interpretation

This paper has given an overview of what student-centered learning is, and how it compares to the traditional teacher-centered classroom. The effectiveness of each classroom structure was reviewed, showing a variety of evidence to support each style, depending on the situation. Obstacles to the implementation of student-centered learning were also reviewed, with proposed solutions given for teachers from the literature.

Which classroom structure is best, and why?

I think all teachers would agree that we need to vary our teaching styles depending on what is being taught, the age and skill level of our class, as well as the personalities and individual learning styles of our students. The best answer to this question seems to be that both classroom structures can be effective, and teachers need to know when and how to implement them effectively.

The research supports traditional teacher-centered instruction at the elementary level, especially when it comes to new skill acquisition. This finding is supported by the research of Jeanne S. Chall (Chall, 2000) in her overview of American education of the past 100 years, where she found higher student achievement in teacher-centered classrooms at the elementary level.   In addition, the National Reading Panel (NRP) reported solid evidence that the teacher centered approach is more effective at teaching children to read (NICHHD, 2000).

This concept makes sense when you consider that students need the basic skills in an area before they can be expected to form a deeper understanding of more abstract concepts. The studies above aren't dealing specifically with math classes, but they are involving new skill acquisition at the elementary level, pointing towards teacher-centered

learning as being more effective in these cases. As an example in the math classroom, students would need to know the basics of addition and subtraction before they can be expected to learn the deeper concepts of algebra or geometry proofs.

Once students gain the basic skills in a particular area, evidence supports student-centered learning as a method to promote better understanding and higher-order thought processes. Studies such as those conducted by Shymansky (1981), Wolfrath (2008), and Baeten (2010) have shown that student-centered classrooms can promote creativity, independence, critical-thinking, and an overall deeper approach to learning. Other studies by Lonka (1995), Lea (2003) and Bredderman (1984) have shown that students in student-centered classes tend to develop better study skills, achieve better grades, and generally have more confidence in their knowledge than students in teacher-centered classes.

This idea of learning on a deeper level and having more confidence in their knowledge also seems logical when you consider how student-centered learning takes place. When students participate in solving problems or work together to discover the answers to questions, they are more mentally and emotionally involved in the thought process than if they were just given the answer. Through this process, they not only discover the answer to a question, but also the "Why?" and "How?" of that answer. They have more than just a superficial knowledge of the concept, but a deeper understanding of where that knowledge comes from and how it is derived.

At any grade level, from elementary through college and beyond, a somewhat blended classroom approach is likely to be most effective at meeting the needs of all students. Authors such as O'Neill (2005) and Baeten (2010) warn of the dangers of using

any single teaching style in the classroom, due to the unique learning needs of each student. Teachers need to be aware of what style works best for which students and for the particular material they are teaching, and choose the appropriate classroom structure for their unique situation.

Regarding the question of how gender affects students in these two types of classrooms, the studies I found are somewhat contradictory. While Moffat (1992) stated that females preferred teacher-centered classrooms, all of the other research I found showed the opposite. Evidence seems to indicate that females are better suited for student-centered, collaborative learning and that males may be more comfortable working independently.

The various studies above have come from all levels of classrooms, elementary through college. While there are clear differences between college level and K-12 environments, I believe that when you are comparing the two classroom structures, the results can be at least partially generalized to all grade levels. As an example, more high school students are taking college level courses for college credit, so the differences between high school and college classes are becoming less obvious. What we know about how student-centered learning affects a college classroom can give us at least some insight into how it will work in the high school or even elementary setting.

What can teachers do to help incorporate student-centered learning into their classrooms?

Using student-centered learning in the classroom can be a frightening thought for teachers, especially those who have perfected the art of lecturing over several years and

are comfortable in that mode of instruction. The most important piece of advice that was gained in researching this paper was to not give up. Results don't happen overnight with student-centered learning, and in many cases the results can take a few years to show up (Lonka, 1995). Brent and Felder (1996) noted that there are steep learning curves for both the instructor and students when implementing student-centered learning. The initial awkwardness experienced by teachers and hostility experienced by students are natural and common. It will help a great deal if teachers have a solid grip on how the student-centered learning process works before attempting it in their classes. If teachers persist through the initial setbacks, research shows that the eventual payoffs will be well worth it.

Another great piece of advice that was gained in researching this paper is that it is a good idea to start with short student-centered exercises mixed in with traditional lectures at first. Simply by incorporating 10 minutes of student-centered instruction into a class period, teachers can significantly enhance learning (Brent, 1996). This helps to ease teachers and students into a student-centered way of thinking, making it a more enjoyable transition for everyone involved. Eventually teachers will get to the point where they are comfortable with student-centered learning and can implement it as needed in their classes.

The research also showed that teachers need to find a balance between being too involved in students' active learning and being too detached from the class. Finding the right level of involvement can help students excel in a student-centered learning environment. Brush and Saye (2000) found that teachers need to be more involved initially, to help students to learn time management skills and accountability. As students

get more experience with student-centered learning, the teacher can back off a bit and

become more of a facilitator of learning, helping to nudge students in the right direction

throughout the learning process.

Chapter 4: Conclusion

In this section, the author includes some details about her own classroom and teaching environment, how she has used teacher-centered and student-centered instruction in the past, and how her classroom structure may change based on her research for this paper.

About My Classroom

The author teaches in a rural high school in north-central Minnesota. The graduating class size is typically about 120, and classroom sizes average about 25 students. The authors' classes include Geometry, Algebra, Statistics and Trigonometry. The author is in her twelfth year of teaching.

My Teaching Style and Classroom Structure

In the author's first years of teaching, she had her classrooms set up in orderly rows with students facing her at the front of the class. She was the lecturer and the students were the learners. A typical day included her at the front of the class teaching a lecture and doing example problems on the board, while the students took notes and worked problems of their own. This original classroom structure was very much teacher-centered and likely reflected on the author's past classroom experiences as well as what she was taught in teaching and learning classes in college.

Today, the author's classroom structure is very different from the one described above. Desks in the author's classroom are arranged in a "U" shape so that all students can see each other during interactive classroom activities. When she does have lectures, they are much more interactive, with the students actively participating in the learning process. Rather than the author doing problems on the board, she now has students

working problems on the board, with their classmates helping when they get stuck. Quite often, the students are in partners or groups, exploring new concepts and actively learning together. The author acts more as a facilitator of learning, moving around the room and giving help as needed, rather than standing at the front of the room feeding information to her students.

Using Student-Centered Learning in My Classroom

Many teachers understand that student-centered learning can help to motivate students and promote better understanding of material. One of the main reasons teachers are hesitant to incorporate student-centered learning into their classrooms has to do with keeping on schedule. This was definitely the case in the author's own classroom. Most teachers have a fairly rigid syllabus and goals for how far to get each quarter or trimester. Teachers have standards that we need to meet and subject matter that we need to cover each year to get students ready for standardized testing. The student-centered approach is somewhat frightening because you must let the students learn as individuals and groups, helping them through the discovery process as a facilitator of learning. Because every student is different, and this learning process may take different tangents for each class, it is difficult to set a syllabus and predict how far the class will get in a specific time. The author has learned that the more teachers use the student-centered approach, the easier it is to "steer" the class in a particular direction or gently "push" them along to assure that you meet all of your goals.

The author agrees that a blended approach is likely the best option for many students and subject areas. The teacher-centered approach is useful and more effective to give students the basic knowledge in a subject area, while the student-centered approach

helps to expand their knowledge, promote critical thinking, and helps students apply their new skills to real life situations. Many times when teaching a particular math skill, the author has witnessed the limitations of using only the teacher-centered approach. As an example, the author remembers teaching a particular skill to the entire class through a lecture and several example problems. As an assignment, the students completed a series of repetitive homework problems, with the intent of driving home the newly acquired skill. However, when a quiz was given on the new skill, many students struggled when they encountered a problem that was worded in a slightly different way than their homework problems. Many students who were able to work all the homework problems correctly after seeing examples on the board could not solve a problem that looked even remotely different on a test. This is because they never really thought through what they were doing on their homework, they were just repeating the steps they saw the author do on the board. This is where student-centered learning makes a big difference, to help students gain a deeper understanding of the skills so they can apply their knowledge more broadly.

The knowledge that the author has gained from researching this paper has most definitely affected her teaching style. Seeing the research data, and knowing that student-centered learning is more effective in many situations has given the author the confidence to use it more often. Knowing that other teachers also struggle with student-centered learning helped the author to be persistent and keep working through the initial tough times. Knowing that student-centered learning can help the author's students be more successful in her classroom and throughout their lives gives the author the motivation to use it whenever she can.

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environments to stimulate deep approaches to learning: Factors encouraging or

discouraging their effectiveness. *Educational Research Review*, *5*(3), 243-260.

Banks, J. A. (1988). Ethnicity, class, cognitive, and motivational styles: Research and

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Studies. *Review of Educational Research, 53* (4), 499-518.

Brent, R. & Felder, R. (1996). Navigating the Bumpy Road to Student-Centered

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Li, Q. (1999). Teachers' beliefs and gender differences in mathematics: A review. *Educational Research*, *41*(1), 63-76.

Lonka, K. & Ahola, K. (1995). Activating instruction – how to foster study and thinking skills in higher education. *European Journal of Psychology of Education, 10*(4), 351-368.

Lubienski, S. (2007). What We Can Do About Achievement Disparities. *Educational Leadership, 65 (3)*, 54-59.

Matthews, W. & Kay, S. (2001). Rediscovering Reality: Considering What Works in the Classroom. *School Psychology Quarterly, 16 (1),* 113-121.

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National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 004769)*. Washington, DC: U.S. Government Printing Office.

O'Neill, G., & McMahon, T. (2005). Student-centered learning: What does it mean for students and lecturers? *Emerging Issues in the Practice of University Learning and Teaching.* Dublin: AISHE.

Shymansky, J. & Penick, J. (1981). Teacher Behavior Does Make a Difference in Hands-On Science Classrooms. *School Science and Mathematics, 81 (5),* 412-22.

Sullivan, P. (2001). Gender differences and the online classroom: Male and female college students evaluate their experiences. *Community College Journal of Research and Practice, 25,* 805-818.

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Wohlfarth, D. (2008). Student Perceptions of Learner Centered Teaching. *Insight: A Journal of Scholarly Teaching, 3,* 67-74.

Zoltan, P. (2009). *Favourable Teaching Approaches in the South Korean Secondary*

Classroom. Paper written for the Korea University – IFLS: Department of

Education, Art & Design.

Annotated Bibliography

Ausburn, L. (2004). Course design elements most valued by adult learners in blended
online education environments: An online perspective. *Educational Media
International, 41*(4), 327-336.

This paper describes course design elements most valued by adult learners in classes that
blend face-to-face contact with online learning. It compares various sub-groups and the
importance that each group applies to different course elements. This paper will be
helpful in comparing how males and females view face-to-face collaborative type group
work as compared to independent style learning.

Banks, J. A. (1988). Ethnicity, class, cognitive, and motivational styles: Research and
teaching implications. *The Journal of Negro Education*, *57*(4), 452-466.

In this article, the author reviewed studies on cognitive, learning and motivational styles
and studied how these things are influenced by ethnicity and social class. He found that
social class is a very important variable when looking at these groups of students. This
article has some important findings about how different ethnic groups prefer to learn,
which will be useful in this paper.

Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning
environments to stimulate deep approaches to learning: Factors encouraging or
discouraging their effectiveness. *Educational Research Review*, *5*(3), 243-260.

This article looks at student centered learning environments and factors affecting deeper
approaches to learning. They review different teacher factors and student factors and
how each affects the development of deeper learning in students. This article will be
helpful to research how to make student-centered classrooms more effective at fostering a
deeper learning in students.

Bredderman, T. (1984). The Effects of Activity-Based Elementary Science Programs on
Student Outcomes and Classroom Practices: A Meta Analysis of Controlled
Studies. *Review of Educational Research, 53 (4),* 499-518.

This study analyzed the effectiveness of three major activity-based elementary science
programs. Study results favored an activity-based, hands-on approach to learning, which
was even more pronounced with disadvantaged students. This will be useful as evidence
in support of student-centered learning as well as contrasting advantaged / disadvantaged
students.

Brent, R. & Felder, R. (1996). Navigating the Bumpy Road to Student-Centered Instruction. *College Teaching, 44,* 43-47.

This paper outlines what student-centered instruction is, and some of the pros and cons of it. The authors address several issues that teachers encounter as they incorporate student-centered learning into their classrooms, and give solutions to these problems based on their own experiences and research. This article will be helpful in describing real-life struggles that teachers have had using student-centered learning, and give evidence-based solutions for making it work.

Brush, T., Saye, J. (2000) Implementation and evaluation of a student-centered learning unit: a case study. *Educational Technology Research and Development, 48*(3), 79-100.

This paper follows a teacher through a student-centered unit, and looks at the problems encountered by the students and the teacher throughout the process. It looks at ways to improve implementation of a student-centered unit, especially with regard to additional aids required by teachers in these cases. This paper will help in assessing some actual issues encountered by teachers the first time they attempt a student-centered unit, and show ways to assist teachers in preparing for this process.

Chall, J. (2000). *The academic challenge: What really works in the classroom?* New York: Guilford.

In this book, Chall examines the differences between student- and teacher-centered classroom approaches, and looks for evidence that one is more effective. She concludes from her research that the teacher-centered approach is more effective, with some exceptions. This will be useful as evidence in support of teacher-centered learning. It will also be helpful in defining student- and teacher centered learning, and listing the pros and cons of each.

Collins, J. & O'Brien, N. (2003). *The Greenwood dictionary of education.* Westport, CT: Greenwood.

This book provides a definition of thousands of terms that apply to education and research. It will be helpful in giving a clear definition of student-centered learning.

Felder, R. M., Felder, G. N., Mauney, M., Hamrin, C. E., & Dietz, E. J. (1995). A longitudinal study of engineering student performance and retention. III. Gender differences in student performance and attitudes. *Journal of Engineering Education*, *84*(2), 151-163.

This article looks at five engineering courses taught at North Carolina State University and examines gender differences in student academic performance, persistence in chemical engineering, and attitude toward their education and themselves. They found

differences in academic performance and also in their confidence as they progressed through the curriculum. They also discuss possible causes and suggest remedial measures for these differences. This article will be helpful to look at both gender differences and minority differences as related to cooperative learning and group work.

Gasser, K. (2011). Five Ideas for 21st Century Math Classrooms. *American Secondary Education. 39 (3).* 108-116.

This paper gives five ideas that math teachers can use to promote the skills needed for students to keep up in a global economy. The author discusses problem based learning and student-led instruction. He gives examples of how teachers should incorporate these things into their own classes. This paper will be helpful in learning how to use these ideas and techniques in a classroom.

Holt-Reynolds, D. (1991). *Practicing What We Teach.* Research report for the National Center for Research on Teacher Learning, East Lansing, MI.

This paper describes a study where the author and colleagues presented known evidence of the effectiveness of student-centered classroom structure to a group of preservice teachers. They then questioned the preservice teachers as to whether they would plan to structure their own classrooms using the student-centered approach. None of the preservice teachers planned to use this type of classroom structure. The author then goes on to question them as to why they made that decision, and looks into what can be done to persuade new teachers to keep an open mind and make evidence-based decisions. This will be helpful in explaining the barriers to getting new and established teachers to incorporate new and alternative teaching methods into their classrooms.

Johnson, D.W., Johnson, R.T, & Smith, K.A. 1991. *Active learning: Cooperation in the college classroom.* Edina, MN: Interaction Book Company.

This book details the use of several different types of cooperative learning in the college classroom, and details how to use cooperative learning in college and secondary classes. It will be helpful in giving examples of cooperative learning lessons and tips for teachers when implementing cooperative learning lessons.

Lea, S. J., Stephenson, D., & Troy, J. (2003). Higher education students' attitudes to student-centred learning: beyond'educational bulimia'?. *Studies in Higher Education*, *28*(3), 321-334.

In this paper, the authors investigated students' perceptions of and attitudes toward student-centered learning. In two separate studies, the authors found that students help positive views toward student-centered learning. They also discussed how their find can affect the implementation of student-centered learning in the classroom. This paper will be helpful in critiquing student-centered learning and to show student acceptance of it in the classroom.

Li, Q. (1999). Teachers' beliefs and gender differences in mathematics: A review. *Educational Research*, *41*(1), 63-76.

This paper reviews the literature on gender issues and teacher beliefs regarding mathematics. The paper deals with both student gender and teacher gender, and how it relates to students in a math classroom. This will help with my comparison and analysis of each gender's approach to different learning styles.

Lonka, K. & Ahola, K. (1995). Activating instruction – how to foster study and thinking skills in higher education. *European Journal of Psychology of Education, 10*(4), 351-368.

This article outlines a study that was conducted over 6 years to compare student preference for a traditional classroom versus a more student-centered classroom. Students felt that they developed better study skills and understanding in the student-centered classes. Students who took more student-centered classes did better on exams and in thesis writing. The students who participated in more student-centered classes were slower in their first three years, but were more successful in the long-term. This paper will be helpful for comparing student-centered and traditional classrooms and supporting the effectiveness of a student-centered approach.

Lubienski, S. (2007). What We Can Do About Achievement Disparities. *Educational Leadership*, *65 (3)*, 54-59.

This article looks at differences in students' response to various teaching styles in the math classroom, and compares the students based on their socioeconomic status. This will be helpful in determining if there is any difference in how students from different socio-economic backgrounds learn.

Matthews, W. & Kay, S. (2001). Rediscovering Reality: Considering What Works in the Classroom. *School Psychology Quarterly*, *16 (1)*, 113-121.

The authors in this article review the book *The academic challenge: What really works in the classroom?* By Jeanne S. Chall. They then evaluate Chall's conclusions and compare her findings to other research in the field. This will be useful in bringing additional points of reference to contrast and/or support Chall's findings.

Moffat, N. (1992). *Girls and Science Careers: Positive Attitudes Are Not Enough.* Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Boston, MA.

This study looked at different classroom structures and what effect they have on student attitude toward science. The study compared students' responses based on their gender. The authors found that classroom structure has a powerful effect on students' attitude in the science classroom for males and females. This will be helpful in analyzing what

effect, if any, student-centered learning has on student attitude, and whether or not a gender difference exists.

Montgomery, S. M., & Groat, L. N. (1998). Student learning styles and their implications for teaching. *Occasional paper*, (10).

This paper discusses why teachers should incorporate different learning styles into their teaching and discusses examples of different learning styles. This paper will help with explaining to teachers the importance of using a variety of teaching styles, as well as describing different aspects of learning styles.

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 004769)*. Washington, DC: U.S. Government Printing Office.

This report assesses the effectiveness of different approaches used to teach children to read. The report supported using teacher-centered classroom structure for this age group. This will be useful as evidence in support of teacher-centered structure.

O'Neill, G., & McMahon, T. (2005). Student-centered learning: What does it mean for students and lecturers? *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

This paper explains what student-centered learning is, and discusses things that teachers can do to help shift their classrooms toward a student-centered approach. It also discusses the effectiveness of student-centered learning and its pros and cons. This paper will be helpful in defining student-centered learning as well as critiquing its effectiveness.

Shymansky, J. & Penick, J. (1981). Teacher Behavior Does Make a Difference in Hands-On Science Classrooms. *School Science and Mathematics, 81 (5),* 412-22.

This paper summarized the findings of seven studies dealing with how teacher behavior affects student performance in activity-centered classrooms. The authors find that activity-centered classrooms encourage creativity in problem solving, independence, and help low ability students overcome handicaps. This will be helpful in support of a student-centered, hands-on learning environment.

Sullivan, P. (2001). Gender differences and the online classroom: Male and female college students evaluate their experiences. *Community College Journal of Research and Practice, (25),* 805-818.

This paper looks at differences in how male and female students experience the online student centered style learning environment. It looks at several aspects of learning and

how each is affected by gender. This will be helpful to research how teachers can better tailor their classrooms specifically to each gender according to their learning styles.

Treisman, P. (1990). *Academic Perestroika: Teaching, Learning and the Faculty's Role.* [Archived lecture]. Retrieved from http://www2.ed.gov/about/offices/list/ope/fipse/perestroika.html

This lecture explains a large study done by a college calculus professor at the University of California – Berkeley in the 1970's. The professor studied at-risk minority students in student- and teacher-centered calculus classrooms, and found a very significant difference in performance. This information will be helpful to show the benefits of student-centered classrooms, specifically with respect to minority students.

Wohlfarth, D. (2008). Student Perceptions of Learner Centered Teaching. *Insight: A Journal of Scholarly Teaching, 3,* 67-74.

This study examined graduate students in learner-centered classrooms, and surveyed them about their experiences in this type of classroom structure. They found that this type of classroom structure made them feel respected as learners, developed their critical thinking skills, and encouraged their self-directedness. This will be helpful to show the benefits of a student-centered classroom structure.

Zoltan, P. (2009). *Favourable Teaching Approaches in the South Korean Secondary Classroom.* Paper written for the Korea University – IFLS: Department of Education, Art & Design.

This paper is written by an English professor at a Korean University. He describes the Korean secondary education system as being very teacher-centered, and discusses the difficulties Korean students have when entering a typical college classroom. He argues for the implementation of a more student-centered approach to help set Korean students up for success after high school. This article will be helpful as he gives several good argument in support of student-centered classrooms.