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# **Cooperative Learning Groups in the Eighth Grade Math Classroom**

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A report on an action research project submitted in partial fulfillment of the requirements  
for participation in the Math in the Middle Institute.  
University of Nebraska-Lincoln

July 2006

## **Cooperative Learning Groups in the Eighth Grade Math Classroom**

### **ABSTRACT**

In this action research study of my classroom of 8<sup>th</sup> grade mathematics students, I investigated whether cooperative learning would lead to a better understanding of the mathematical concepts and thus more success for the students. I used my three eighth grade classes with two using cooperative groups and the third not. I discovered that the students who wanted to work in cooperative groups were more successful than they had been. I also discovered that the grouping itself has a great effect on how the group works together. The wrong grouping of students can lead to disaster and many headaches for the teacher. Overall the two classes that used cooperative groups did better grade wise than the one class that was taught using the traditional way of not using cooperative groups. As a result of this research, I plan to continue using cooperative groups but will be more aware of the students who are grouped together.

The purpose of this study is to see if cooperative learning groups within the eighth grade classroom promote a deeper understanding of mathematics and therefore lead to better success rates for the students now and for future mathematics classes.

In the previous 15 years, my classroom consisted of desks arranged in straight rows with limited interaction between students. This year I have arranged the desks into pods of three and changed the seating chart once every quarter for this project.

My problem statement for this research read, “Will learning communities within the eighth grade classroom promote a deeper understanding of mathematics?” How do I define deeper understanding? How does one test for deeper understanding of a whole class?

I will attempt to show the benefits and limitations of cooperative learning groups for both the students and the teacher. To do this, I will use student based homework assignments, student surveys, State Standard Assessments, and videotaping.

### **PROBLEM OF PRACTICE**

I have struggled for many years wondering how to get students to know the whys, not just the hows of math. The students can learn the proper steps to take in order to solve a problem, but do they really understand why they are doing those steps? I am trying to find a way for students to not only be successful in math this year but for years down the road when they do not have me as their teacher.

For the past 15 years my classroom has consisted of desks arranged in straight rows which limited interaction between students. I never really encouraged group work; in fact, I frowned upon it. It seemed that every time I saw students “working” together there

was one student working the problem and the others simply copying the answer. I, therefore, discouraged it and made the students work on their own with me, the teacher, trying to answer all their questions. That was fine when I was younger and had tons of energy and could race around the classroom answering many questions each class period all day long.

After taking a class myself in which learning groups were used, I saw some possible benefits to group work, and it tweaked my curiosity to see if learning communities/groups would work in an eighth grade math classroom. This year I have arranged the desks into pods of three and change the seating chart every Monday of every week, which allows students to work within different groups. I make sure to give wait time in order for the students to work together on a given problem and walk around to make sure that all are participating. Math is a difficult subject for many students and the more “teachers” I have in the classroom the more opportunity those struggling students have to get help and be successful. By having the students working with each other, they are going to have to tackle the deeper questions of why a certain step is taken or why you cannot take that step. At least that is what I want to find out: Will deeper understanding take place? The two high school math teachers in my school system are also trying the community learning groups this year so I will have data from different age groups. Some of the other curriculum teachers are using or have tried learning groups before which will give me another set of data to compare and contrast with my own data.

Through communication within the groups, the students will be organizing and consolidating their mathematical thinking. They will be able to communicate their mathematical thinking to peers and teachers. Eventually they will be able to analyze and

evaluate the mathematical thinking of others. Would not all this lead to greater success for the students?

I absolutely hate to fail students. It is a fact that some students just plain don't care about mathematics (or about academics). So, why not use some peer pressure? We have all read and heard about how strong peer pressure is for the middle school students. Let's use it to our advantage. How many eighth grade students do you know will tell their friend that they don't care and just want to be stupid for the rest of their life? With learning groups I hope to capture some of that strong influence and make it work in a positive way.

How will I be able to tell if learning communities/groups promote a deeper understanding of mathematics? By listening and talking to the students; hearing the terminology and language they use; by listening to see if they can explain the "whys" to other students; by listening to see if they can make connections to other problems within mathematics or outside; and then by also following their progress through high school and beyond. Do they stay interested in mathematics? Do they choose careers which are strongly influenced by mathematics?

It is my thought that by the end of this action research project I will have data to show that learning communities within the eighth grade math classroom do indeed promote a deeper understanding of mathematics. If this does prove out like I suspect, many other teachers will benefit from this project and hopefully their students will too.

## **LITERATURE REVIEW**

There has been much research conducted on cooperative learning groups and their effects on social and academic skills. Of this research, most has been completed using

subjects in grades first through eighth where the “sit still, listen to lectures, take notes” style of teaching is not conducive to learning. Students must be taught in a manner that is conducive to their learning (Holliday, 2001). Teachers need to realize that “IF WE ALWAYS DO WHAT WE HAVE ALWAYS DONE, WE WILL GET WHAT WE ALWAYS GOT” (Holliday, 2002). To maximize educational learning educators need to be in tune with their students and to provide them the best opportunities to achieve to their fullest potential. Cooperative learning allows the students to take on the responsibility of their learning.

According to previous research, the most effective cooperative learning groups consisted of three to four students working toward a common goal. A general goal of cooperative learning groups is for students to maximize their own learning while also maximizing the learning of all other group members. Cooperative learning groups provide an atmosphere in which students can take risks within a smaller group and not be ridiculed. The group is a sort of safety net which allows the students to step out of their normal comfort zone. One report showed that students expressed a sense of relief that it was not all up to them to figure it out; there is a team to work through it together (Bernero, 2000). Cooperative learning groups encourage interaction within the base group with each member sharing responsibility for the work produced. In the area of mathematics this is a factor that cannot be overlooked. Cooperative learning seems to have resulted in higher level reasoning, more frequent generation of ideas and solutions, and greater transfer of what is learned from one situation to another (Johnson & Johnson, 1999). According to the National Council of Teachers of Mathematics, communication is an essential part of mathematics and mathematics education.

When implementing cooperative learning groups, appropriate social skills and personal interactions must be taught. The whole idea of successfully working in a group depends on the actions of each individual within the group. The base group serves many purposes. It will give the support and encouragement each member needs to make academic progress and develop cognitively and socially. The social skills that will need to be learned include what the role of each member should look/sound like, rules and expectations (Bernero, 2000). When forming groups, personalities, friendships, and past achievement must be taken into consideration (Horner, 2000). Researchers have stated that cooperative learning groups have a far wider affect than just academics. Students developed a mutual respect within their base group which, in time, transferred to other situations within the school setting (Schroder, Basken, Engstrom, & Heald, 2000). Cooperative learning has been found to positively influence the relations of mainstreamed special education students and their classmates. “Discipline problem” students became actively involved in their learning and were allowed room for discussions. This helps in reducing discipline problems school wide.

Some question the effectiveness of cooperative learning groups on the already high-ability students. Research shows that these high-ability students do indeed benefit from cooperative learning groups. Some high-achieving students do not like working in small heterogeneous groups for they felt used by their group (Holliday, 2001). But the amazing fact remains that by working in a group and having to explain to others their reasoning, the high-achieving students are therefore thinking more deeply than they would have on their own. There is evidence that the high-ability students are better off academically when cooperating with medium- and low-ability peers rather than working

alone (Veenman, Kenter, & Post, 1999). On the flip side, low- and medium-ability students benefit when they are able to observe the strategies of the high-ability students.

Research has shown that cooperative learning groups have a positive impact on developing social skills, academic achievement, self-esteem and self-confidence among all students. When efforts are structured cooperatively, there is considerable evidence that students will achieve more (learn more, use higher level reasoning strategies more frequently, build more complete and complex conceptual structures, and retain information learned more accurately), build more positive and supportive relationships (including relationships with diverse individuals), and develop in more healthy ways (psychological health, self-esteem, ability to manage stress and adversity) (Johnson, 1999). Three heads are better than one (Janes, Koutsopanagus, Mason, & Villaranda, 2000). Researchers also agree that monitoring noise level and conversation topics were challenges when using cooperative learning groups. This, however, improved over time as students became more involved in the group activities and monitored themselves. Overall results clearly showed that the benefits of cooperative learning groups far outweigh the negatives. So what are educators waiting for?

This action research project is intended to examine the affect of cooperative learning groups in promoting a deeper understanding of an eighth grade mathematics curriculum. The students will be gradually switched from a direct instruction approach to a cooperative learning environment. Groups will be formed based on past grades with students from different ability levels working together. Many teachers, including those who teach mathematics, are sure to benefit from this research.

## **PURPOSE STATEMENT/RESEARCH QUESTIONS**

Data collection took place during the spring semester, 2006 in the researcher's classroom. This study will answer these research questions:

- Will the effective use of cooperative learning groups improve achievement in math?
- How will the use of cooperative learning groups impact individual participation in math?
- Will students' attitudes toward math change when cooperative learning groups are used?

## **METHODOLOGY**

The methods used for this action research study varied depending on what I was looking to prove or disprove. I was first looking to see if the effective use of cooperative learning groups would improve achievement in math. For this, I kept all homework assignments and unit tests the students took throughout the second semester. I then looked at the individual grades of the students and compared those grades with last year's and the first semester grades. Since I was studying eighth grade students I also had the completed State Standard Assessments to look at.

I was also looking to see how the use of cooperative learning groups would impact individual participation in math. I kept a journal to record observations of instances of lack of participation. I videotaped one class on two occasions to see how the students interacted with each member of a group.

The students kept a journal over the course of the second semester to see how their attitudes may have changed over the duration of this project. These journal entries were used to answer the question: Will students' attitudes toward math change when cooperative learning groups are used? The class was again videotaped twice to watch the body language and non-verbal reaction of the students toward the subject of math. Student surveys were collected at the beginning of the project and again at the end of the project (Appendix A & C).

During the entire action research project I did not change my teaching style as compared to before the project. I kept that a constant so I had some true comparisons. I incorporated some habits of the mind type of problems in the class of thirteen Algebra 1 students that I used cooperative groups with. I did not use these types of problems in the other classes.

## **ANALYSIS**

The three research questions that I was trying to answer with this action research were 1) Will the effective use of cooperative learning groups improve achievement in math? 2) How will the use of cooperative learning groups impact individual participation in math? and 3) Will students' attitudes toward math change when cooperative learning groups are used? I collected the homework assignments and tests the students took throughout the research period which was the second semester, January 2006 to May 2006, of the school year. This allowed me to see what the students were doing and how they were completing their work. On February 15, the students made their initial entry in the journals and then made five more entries throughout the semester. I started a journal on

February 2<sup>nd</sup> and was hoping to keep an entry every week, but I only wrote every other week. The students filled out a pre-research questionnaire (appendix A) at the beginning and a post-research questionnaire (appendix B) at the end. I also videotaped the class twice to see what was happening when my back was turned.

Improved achievement, at first, did not happen. In fact, it declined slightly. The students initially rejected the idea of working together, and some of them just started copying from their group members. For the first two or three weeks, the low-achieving students were basically copying from the others. By copying homework assignments the students were not ready for the test and did poorly on it. The overall average dropped five points. From then on, however, things did improve as the students figured out how to use cooperative groups to their advantage. I had to continue to monitor the students to be sure that they were helping each other through the processes of the problems presented to them. This monitoring included some direct instruction about how to work within a group. Individual participation improved since implementing the group theory. Once each member of a group got comfortable with the other members, they started to talk through the problems with each other instead of each student working the problem on their own and then comparing answers. The students were also now more likely to work a problem on the board in front of the entire class. By creating some competitions between groups I encouraged the members of each group to take an active and responsible role within their group. The group with the highest group test average got a prize/reward consisting of pencils, chocolates, or bonus points. I felt the tension growing from different groups as the competition got fierce and they were working together toward a common goal/reward. Some peer pressure was being applied to the students

who did not want to work within the groups because they would then bring the group average down on test day. I tried to remain positive as the students were coming out of their shells and participating more in discussions. Yes, some of the things said were not relevant but I had to guard against stifling the progress that had been made. With increased participation, I was sensing an increase in noise as the students were actively discussing with each other. How do you control the noise without squashing the energy? And is this improvement in participation actually improving the achievement in math?

I am now happy to report that the grade averages did climb to a higher level than they had started at. The students were working well with each other and life was good. The last test they took the class average was an 87.5%, which was their second highest of the entire year. The highest being the very first test of the year which was all review from last year's work. Not only were the grades higher, but very little explanation was needed in going over the test. The students had a real grasp of the concepts and basically were able to explain to me what they had missed and how they could fix the error. This was astonishing to me that even the low-achieving students could look at the problems they missed and know exactly why they had missed it. So many times I have seen students totally baffled by a missed problem and not able to see the mistake. Not this time, for this group of students had a real handle on the concepts.

The eighth grade took the CAT/8 achievement test and when asked how the math part of it went the response was unanimous. They felt very confident that they had done very well on the math portion on the test. How much of this is attributed to cooperative groups or to individual study habits? From what I have witnessed I would have to say a little of both. The little groups seem to be working well together and they are even

fighting over the correct procedures now. Having group competitions has also helped in getting everybody within the group involved and making sure that no one was left out.

I saw certain individuals thrive in this environment. By being in a smaller group they were more comfortable in asking for help when needed. At the beginning of the semester I noticed that some students were reluctant to participate for fear of what others may think of them. Not so anymore as the whole class got involved in class discussions; they will even argue with each other and take sides. I have two young ladies who came in the mornings for extra help for they did not want to let their groups down and did not want to be perceived as the slow kids. Is this a bad thing? I say no, because these two students have made the decision to get better at math, where if they were not assigned to a group they may not care and just fall behind. Overall, I saw more individual participation which may have something to do with the increased grade averages (appendix E) I talked about above.

I did not notice an outright change of attitudes for math. The students still look at math class as the hardest class they take and because of that still have negative feelings even though they may be doing very well in class. The student journal entries and questionnaires showed mixed reactions to the cooperative groups (Appendix B & D). Most of the negative comments came by the fact they did not like the other members of their group and why couldn't they be in the group with the smartest individual. I witnessed a dramatic change in two of my special education students who were now able to help the other students within their group. They had already gone over the problems in their resource study hall and were now able to explain the process to their group. This

made them feel so special, and they were actually smiling as they entered the classroom door now.

I still had some students who did not want to work as a group and were struggling a little. They ignored the other two students in their group or they asked to sit in a desk away from their group. I kept pushing them to the idea of asking their group members for help before asking me. How do you make sure that they are getting the help they need without interfering with the group philosophy?

As mentioned above, the students felt good about how they did on the CAT/8 tests and were thinking that that portion was the easiest portion of the whole test. Amazing! I still get the questions, "Why do we need this?" or "When will we ever use this?" Some things will never change. But what I did see was that there were now students who were answering those questions instead of me, and there was an increased interest in math class in general. Whether it was the group work or other factors, the students wanted to come to math class. Even the low-achieving math students wanted to be in math class. Yes, we have fun most days with dice games and card games, but I think that the students also see themselves as part of something in the cooperative groups and did not want to be left out. I have had students this year who are sick and will try to tough it out until math class is over and then go home, or there are those who are sick in the morning and stay home from school but will come back to school in time for math class. Of course, there are still the few who do not want to be in a group and would rather work alone, but even these students eventually come back to the group for help. Getting students in class is half the battle, and so far I am not having that trouble at all.

In the middle of the action research project, March 13<sup>th</sup>, the students were put into

new groups, but not before making a journal entry on what they expected out of the new group. Here are some of their thoughts:

- I am hoping to be in a group as good as the one I am now in.
- I want to be in a group that will help me.
- I'll miss (student) in my group.
- The new group might be able to tell me what I don't understand better than the group I am now in.
- It will give me an opportunity to meet and learn more about different people.
- I am more concerned about where in the room the group will be put.

Once the new seating chart was in place I then had the students journal about what they now expected out of their new group. Here are some of their new thoughts:

- This group will be fun.
- My group is not what I wanted but it is okay.
- I am sitting in a group with lesser understanding so I expect more work.
- We just need to help each other with the things we know.
- I don't expect anything from my new group.
- I am more comfortable in this group and will ask for more help.
- One member of my group will not be any help at all for she is loud and annoying.
- I expect this group to be a cooperative group that helps each other.

As can be seen, there were a lot of different views concerning the new groups

I did run into an unexpected twist when I switched groups. I had grouped some students together who (I found out after the fact) did not get along with each other. In fact, they annoyed the heck out of each other. That was not a good situation so I had to regroup almost immediately.

On the second to last day of this action research, May 16<sup>th</sup>, I had the students fill out a post-questionnaire (appendix C). Most of the students wrote comments that showed they enjoyed the opportunity to work in cooperative learning groups. Here are some of their comments after having used cooperative learning groups for a whole semester.

- I really liked the groups. I liked getting help and being more open with each other in class.
- It made it fun but still got information out of it.
- Working with my partners in Math taught me how to work with them the same way in other classes.
- Communication is the key to education.
- It was sometimes easier to figure out how to work the problem and a lot less frustrating.

Of course, not all were positive. Take these for example:

- The groups did not affect my retainment.
- Math is boring no matter how you learn it.
- I hate working with stupid people.

I still had a couple of students at the end who did not want to work as a group and were struggling a little. These students whine about everything and their confidence in life in general is low. These two or three students are always looking for the easy

way to do something and if they cannot find it immediately they give up and just say, "This is stupid."

Overall, I now feel that the cooperative groups worked well. It took a while for the students to catch on to the idea but now we all see the benefits. If done correctly, using appropriate groupings, incorporating it into the class every day, letting the students discuss math problems openly, and group competitions, the use of cooperative learning groups is a win-win situation.

### **INTERPRETATION**

Are cooperative learning groups the end all of teaching and learning styles? I think not. By using cooperative learning groups for one semester my students did better the second semester than they had done the first semester not using the groups. The students, for the most part, seemed to enjoy the opportunity to work with each other to try to solve some of the more complicated problems. But what about independent thinking skills? With the cooperative groups, some of the students relied on the other students in their group to think of solutions and they never had to think of, or come up with, a solution on their own.

The noise level was much noisier than I had anticipated. With five or six groups working at the same time, the talking at times elevated to the point where I had to step in and control it. If left alone, junior high students are loud to begin with. Letting them work in groups sometimes magnified the sound and they had no clue they were getting louder. Toward the end of the semester they were starting to self-regulate themselves so that I did not have to get involved. I would just listen to their conversations and would

often be amazed by what was happening. Not only were the students working on the math lesson, they were also talking about their personal lives and getting to know each other better. I, too, learned some things about students that I had not previously known. One student liked to read the same murder-mystery novels that I do, and another student liked to listen to classical '70s and '80s music.

In general the class bonded together. It did not make a difference of ability levels as they quickly found out that they had to work together and help each other improve if they stood a chance of winning the competition prizes. Having group competitions on tests, with the highest group average being declared the winners, was probably the best idea I had. The students really tried hard to improve so that the entire group would do well.

There were some students who just did not like to work with others. They felt that they could accomplish more and do it better than the group could. And for the most part at this grade level they could. As eighth graders these students will see very diversified teaching styles as they continue with their education. Some of their future teachers will use cooperative groups and others will not. Now that they have had a taste of cooperative learning groups I feel they will be better able to handle group situations in the classroom and/or in the business world.

I found that using cooperative learning groups took some of the pressure off me as the teacher. Instead of me having to try to help everybody I only had to help each group that was having difficulties. That meant that I might be helping two or three students at once instead of one at a time. There were even some days that I taught the new concept and that was all that was needed of me. The students helped each other and took care of business. It was not nearly as stressful for me as I did not have to answer a hundred

questions each class period. Knowing that the students were capable of doing this made it easier to plan for a substitute when I was absent; I knew that the students would be able to work through it together.

I think that using cooperative learning groups as a part of the total teaching practice makes good sense. To use it solely by itself might be leading to trouble for some students down the road. A good mixture of group work and individual work will keep the students thinking for themselves but also able to bounce ideas off others and come to the best possible solution. I hope that my students are prepared to handle situations by themselves or now within a group.

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## APPENDIX A

### Student Questionnaire Pre-Action Research/Davis 2006 Cooperative Learning Groups

Name: (optional) \_\_\_\_\_

When I think of school, I think...

Interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Boring
Happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sad
Easy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Hard
Useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Needed
Nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Happy
Good Grades	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Bad Grades

\_\_\_\_\_ is my favorite subject.

I like to work

Alone	<input type="radio"/>
With a group	<input type="radio"/>

When I think of Math, I think...

Interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Boring
Happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sad
Easy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Hard
Useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Needed
Nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Happy
Good Grades	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Bad Grades

In Math, I like to work

Alone	<input type="radio"/>
With a group	<input type="radio"/>

## APPENDIX B

### Pre-Action Research Questionnaire Results

When I think of school, I think...

Interesting	(5)	Neutral	(4)	Boring	(3)
Happy	(4)	Neutral	(7)	Sad	(1)
Easy	(6)	Neutral	(2)	Hard	(2)
Useless	(1)	Neutral	(8)	Needed	(3)
Nervous	(1)	Neutral	(6)	Happy	(5)
Good Grades	(7)	Neutral	(4)	Bad Grades	(1)

I like to work....

Alone (5)  
With a group (7)

When I think of Math, I think...

Interesting	(8)	Neutral	(4)	Boring	(0)
Happy	(8)	Neutral	(3)	Sad	(1)
Easy	(1)	Neutral	(6)	Hard	(5)
Useless	(1)	Neutral	(7)	Needed	(4)
Nervous	(1)	Neutral	(7)	Happy	(4)
Good Grades	(5)	Neutral	(4)	Bad Grades	(3)

In Math, I like to work...

Alone (3)  
With a group (9)

## APPENDIX C

### Post Attitudinal Survey of Students in Cooperative Learning Project Davis/2006

Please read the following statements concerning the cooperative learning project that you have just completed. Please indicated your agreement of disagreement with the statement read by circling the response that best describes your feelings about the cooperative learning project. If you strongly agree with the statements, circle SA. If you only agree with the statement circle A. If you have no opinion about the statement circle NO. If you disagree with the statement circle D. If you strongly disagree with the statement circle SD.

Below each statement, please write briefly why you agree, disagree, or have no opinion concerning the statement.

Your participation in this project is greatly appreciated.

1. I have learned more Math skills in small cooperative groups than in a regular class setting.

SA    A    NO    D    SD

Why?

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2. I enjoyed working on Math problems with other students in small cooperative groups more than I would have enjoyed working the problems by myself.

SA    A    NO    D    SD

Why?

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3. The small cooperative group activities allowed me to learn quicker and retain more for the Math tests.

SA    A    NO    D    SD

Why?

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4. I felt my teammates and I learned from each other.

SA    A    NO    D    SD

Why?

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5. I thought the competition between groups was appropriate.

SA    A    NO    D    SD

Why?

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6. I would like to see small cooperative learning groups used in more of my classes.

SA    A    NO    D    SD

Why?

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—

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7. I thought using small cooperative groups made learning Math skills boring.

SA    A    NO    D    SD  
Why?

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8. I believe I was taken advantage of by being in small groups because others in my group expected me to do the work.

SA    A    NO    D    SD  
Why?

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---

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9. My opinion of some of my classmates changed in a positive way because of the small cooperative groups that I participated in.

SA    A    NO    D    SD  
Why?

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10. I learned to work better with different students in the small cooperative groups.

SA   A   NO   D   SD

Why?

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-

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---

11. I like the way my Math teacher taught his Math lessons using small cooperative groups, better than the way my other classes were taught.

SA   A   NO   D   SD

Why?

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-

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---

12. I thought the small cooperative groups were too noisy during class.

SA   A   NO   D   SD

Why?

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-

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---

13. I learned more Math skills because I was responsible for teaching my teammates.

SA   A   NO   D   SD

Why?

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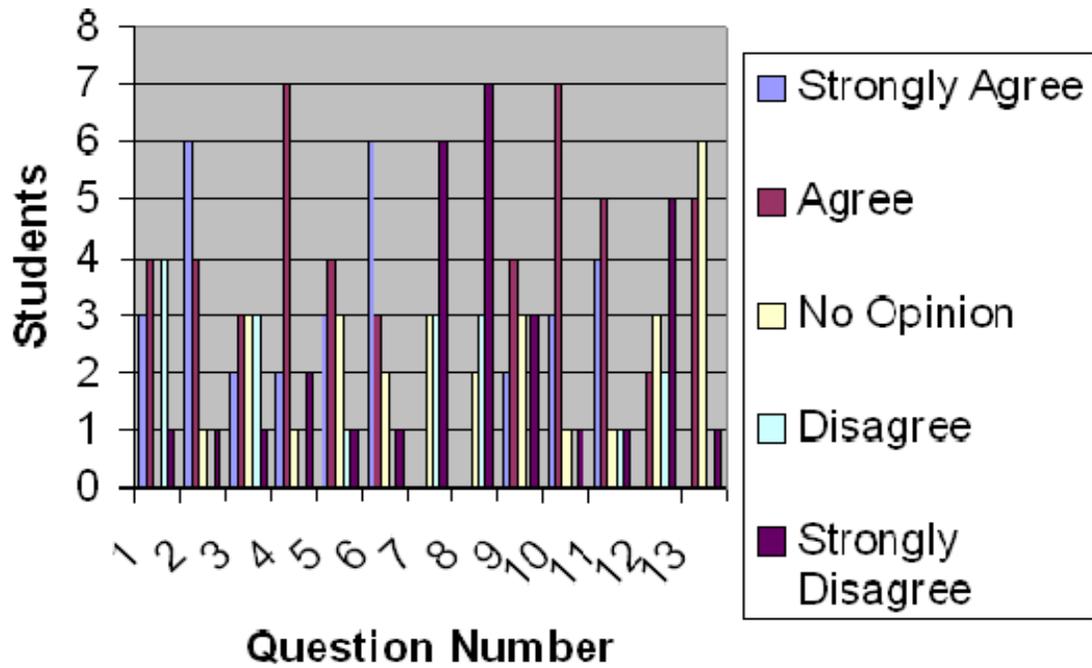
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## **APPENDIX D**

## Post Attitudinal Survey Results



STUDENT	12-21-06 PERCENT	12-21-06 LETTER	05-16-06 PERCENT	05-16-06 LETTER
A	86	B-	94	A
B	98	A	99	A+
C	84	C	91	B
D	86	B-	90	B
E	94	A	96	A
F	86	B-	90	B
G	89	B	90	B
H	80	C	87	B
I	93	A-	93	A-
J	86	B-	93	A-
K	79	C	85	C+
L	88	B	96	A
M	87	B	94	A