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## Group Encouragement: Action Research on Cooperative Learning

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Group Encouragement:

Action Research on Cooperative Learning

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*Abstract: Cooperative learning groups help students develop twenty-first century skills. Teachers may choose to constantly change the memberships of the cooperative learning groups so that students rarely work with the same people or teachers may choose to use a home group structure in that students always work with the same people. In this action research with two fifth grade math and science classes, it was found that most students enjoyed working with short-term groups and long-lasting home groups, but there was a large minority of students who did not enjoy working with their home groups following the three-month time period that the home groups were in existence. Nevertheless, most of the students in the groups that worked as cooperative learning groups enjoyed working in their groups; whereas, more of the students in groups that did not work as cooperative learning groups did not enjoy working as much in their groups. In addition, in both the group structures, the majority of students were comfortable asking their group members questions and helped their group members with questions they had.*

## **Introduction**

As teachers begin to move away from the traditional lecture style of teaching to a more collaborative work style among their students, teachers need to place students into groups more often. And by using this collaborative work style, teachers are beginning to group students multiple times during a lesson, with a desire for students to work in groups in order for students to discover and discuss the information, rather than be told the material. Furthermore, in my own student teaching placement in fifth grade math and science, students often enjoy working in groups. After the first time students worked together in the groups that I had established, they explained how much fun they had that day in learning because they had the opportunity to work with their peers.

To achieve more effective learning, group work is essential in the classroom and oftentimes in the work environment. Students need to learn how to work well with others in an appropriate and professional format through constant group work in the classroom. Also, teachers need to implement group work and projects in such a way that all students benefit from working in a group, including the highest achieving students in the class, the lowest achieving students, and all students in between. And due to the essential need to be able to effectively work with others in a group setting in both the school and work environments, teachers need to implement a format of group work that is effective and beneficial for all students to learn the appropriate skills of working in groups, as well as the material presented in the class.

But with the constant need to work collaboratively in order for students to learn the information better and to develop the skills needed to work with others, it is questioned whether my fifth grade students would prefer working with the same students every day in long-lasting groups versus working with different students in short-term groups. I hypothesize that students

will prefer working with their long-lasting, set groups more than short-term groups. Moreover, it is questioned how well my students can learn to cooperatively work with one another through these variety of grouping styles.

### **Literature Review**

As the world continues to thrive in and dive deeper into the knowledge based society of our Information Age, our education system should reflect this change in how society primarily operates. In her 2012 book *Now You See It*, Cathy Davidson states, “By one estimate, 65 percent of children entering grade school this year will end up working in careers that haven't even been invented yet” (p. 18). It is often questioned within the field of education how educators are supposed to accurately prepare children for a future career when the teachers do not even know what the future careers will look like. Our society is constantly being impacted and molded with the introduction of new technology and new ways to complete tasks. So, while we do not know what future careers will exist, we must continue to prepare our students with appropriate skills to enable them to succeed in the ever changing 21<sup>st</sup> century.

Job skills that are required in the 21<sup>st</sup> century are those skills that students need to possess in order to succeed in the present and future workplace. These skills include creativity, critical thinking, communication, collaboration, literacy competency, flexibility, initiative, productivity, leadership, and responsibility (Partnership for 21<sup>st</sup> Century Learning, 2011). Partnership for 21<sup>st</sup> Century Learning (P21) (2011) states, “Learning and innovation skills are what separate students who are prepared for increasingly complex life and work environments in today’s world and those who are not” (p. 2). By possessing these skills, students will have the capability of successfully adapting to a changing work environment and career.

Researcher Marcel M. Robles (2012) conducted a survey over the course of two years asking business executives what they believed are the most important soft skills, which are interpersonal qualities and personal attributes, for employees to possess. It is through these skills that one is able to approach a situation in the best manner possible, whether that be by keeping calm in a heated discussion, or when interacting with a customer, or solving a problem that has recently surfaced that must be resolved quickly, or working with a group of coworkers to create a final product. From the survey, in the order of what most executives believed were the most important to least important of the ten skills listed, are the following soft skills: integrity, communication, courtesy, responsibility, interpersonal skills, positive attitude, professionalism, flexibility, teamwork skills, and work ethic. Renee Evenson (1999) even believes that these soft skills are much of the determining factors for whether or not someone gets a job and whether or not someone keeps his job. Peggy Klaus (2010) explains that some businesses rank the criteria of “interpersonal skills” higher than academic abilities, or even a college degree. And as our society continues to move to one centered around technology, with the answer to any simple question being at a person’s fingertips, companies are continuing to value these soft skills more and more for hiring purposes.

One principle of education is to prepare students for their futures and more specifically, their careers. As a result, educators should be teaching students the soft skills that researcher Robles examined, which will allow students to succeed in the workplace. Several of these soft skills can be taught through the method of cooperative learning, which is a different teaching strategy than group work. Simply placing two people beside each other or putting people together into a group does not constitute cooperative learning, but rather group work. Johnson and Johnson (1999) explains that a traditional classroom learning group has the potential for

some students to create a final product that achieves a better result than if they worked alone, but that the students who are hardworking and conscientious would have achieved those same high results or even higher results if they had completed the assignment individually. Several characteristics of a traditional classroom learning group exist that make it different from a cooperative learning group, including the following: students are evaluated as individuals, rather than as a group; students may ask their group members for help, but the group members are not motivated to teach their understandings to their group members; and some group members may become free riders, that is, they do not fully contribute to the work of the group.

In contrast, Johnson and Johnson (1999) describes that cooperative learning involves group members having a shared and common goal that is directing the team and group members' work so that everyone in the group succeeds, rather than a competition being evident. Furthermore, Cynthia J. Brame and Rachel Biel in the article "Group work: Using cooperative learning groups effectively" (2015), explain that cooperative learning is effective because it allows students to connect cognitive processes with their social activities, which Lev Vygotsky developed as the sociocultural theory of development. Thus, students are working within their zone of proximal development when completing cooperative learning activities as they work just outside of their developmental level together with a peer.

Characteristics that exist among group members in a cooperative learning environment involve discussing the assignment with each other, helping each other understand the concepts, and encouraging each other to complete quality work. As a premise, cooperative learning is designed so that each member of the group performs better on the final project with the whole group working on it, rather than if each individual had completed the assignment on her own. Cooperative learning is usually a supplement strategy to teaching and involves the students

discussing or practicing the skills just learned or discovering the information for themselves (Slavin, 2010). The activities involving cooperative learning can be completed in one class period or over the course of several (Johnson and Johnson, 1999). Johnson and Johnson (1999) explains, “The purpose of cooperative learning groups is to make each member a stronger individual” (p. 71). Nevertheless, it is the teacher’s responsibility to create a structure within the classroom that allows students to partake in successful cooperative learning.

In order for cooperative learning to be effective in the classroom, the teacher must incorporate certain elements into the design of the tasks asked of the students (Johnson and Johnson, 1999). First, positive interdependence must be established, which is the belief that each person’s success in the group is reliant on each group member. In order to appropriately establish positive interdependence, mutual learning goals need to be established, and joint rewards, divided resources, and complementary roles may be used to increase positive interdependence within the group. Cooperative learning also needs to involve individual accountability, which holds each student accountable to do his share of the work in order to make each individual of the group improve his achievement. Students need to engage in positive, face-to-face interaction too, which includes helping, assisting, supporting, encouraging, and praising one another. Even though students will develop cooperative learning skills throughout the group process, students must understand how to use these social skills first in order for the cooperative learning to be effective. These social skills include leadership, decision-making, trust building, communication, and conflict management. Finally, students need to engage in group processing when conducting cooperative learning, which is the process of groups discussing how well they are achieving their group goals and how well the group is working together as a team.

Similar to Johnson and Johnson’s theories, Spencer Kagan has developed six key

concepts that make cooperative learning more effective (LearnNTeach2712, 2012). First, students are to be placed in teams, which groupings are to establish a strong, positive team identity and last over time. Due to the team structure, it is expected that the students will become more comfortable with the other students they are working with and each student will provide mutual support to the others. Ideal teams are heterogeneous in nature, consisting of one high achiever, structured appropriately by the teacher, with individuals not randomly assigned to teams, and composed of four members.

To operate effectively, the teacher plays a significant role in structuring both the teams and classroom. First, the room needs to be organized so that team members can easily discuss and work together and so that all students can easily see the teacher and board. The teacher also needs to have a quiet signal to quickly and effectively get the students' attention to either address a question or issue or to continue with the lesson. In addition, the noise level needs to be appropriate throughout the entire process. The materials required for the class period also need to be effectively distributed, whether that be through a designated student or an ordered system designed by the teacher. Finally, the rules of the teams and the responsibilities of both the teams and the team members need to be established through the class rules and norms so that the teams may operate successfully.

Kagan's third concept that builds effective cooperative learning is that of the willingness to cooperate. Team members need to have a positive team identity, which includes respect, trust, and enjoyment of working together. As is the premise of cooperative learning, students need to understand that no one person can complete the assignment on his own—he needs other people to successfully complete the task. Kagan believes that instead of competition between individuals in the classroom, encouragement and support should be what cooperative learning is

centered around. Through this type of classroom, students have a sense of belonging. Teachers may engage in class goals or rewards to further support this type of support in the classroom. Even though some competition may be effective, students should first develop a sense of belonging in order to fully engage in the cooperative tasks. Furthermore, as explained by Slavin (1983), it is often at this early adolescent age that students begin to look to their peers for norms, rather than parents or teachers. However, a classroom environment that includes students encouraging each other to succeed academically may result in students having a stronger motivation to work hard and do well in school. This is contradictory to other classroom norms in which students compete against each other, especially for grades, which can lead to a negative stigmatism of academics and hard work.

Nevertheless, as explained in Kagan's fourth concept, the atmosphere between separate teams may affect how well students achieve or participate in cooperative learning. The between-team tasks can involve each group having separate responsibilities for the whole class to come together at the end to contribute to an overall class goal, or each team may have the same end goals, in which the teams are competing against each other for limited resources or rewards.

Similar to Johnson and Johnson, Kagan explains that there are essential aspects of cooperative learning that must be present in order for cooperative learning to be successful. Kagan places the four characteristics of cooperative learning into an acronym, PIES: positive interdependence, individual accountability, equal participation, and simultaneous interaction. Finally, Kagan explains the structure to which the classroom and teams are designed can greatly affect the use of cooperative learning. Nevertheless, as there are a large variety of structures to choose from, the teacher must decide which structure would be most effective for the given students and topics being studied.

In a meta-analysis by Slavin (1983) of 32 studies that used both group rewards and individual accountability, 28 of the studies showed significantly higher achievement in the cooperative learning groups than the control groups. Slavin (1983) explains that it is through the structures of group rewards and individual accountability that result in each group member's contribution to the assignment and encourages group members to support each other in their learning. The positive peer pressure can encourage students to try harder, pay attention, and stop clowning around. It is hypothesized that within a cooperative learning group, members create a system of rewards to ensure that all members are working and to ensure that the group reward is achieved at the end. While there are differences between what should be included in the cooperative learning structure between Johnson and Johnson, Kagan, and Slavin, all three sets of researchers have established that there are key components that must be included in the structure of cooperative learning to ensure its success.

Oftentimes, cooperative learning is viewed as a teaching strategy that can only benefit a few students in the classroom. However, cooperative learning has the capability to help each child improve in different areas, whether that be academically, socially, or individually (Augustine, Gruber, and Hanson, 1989-1990). Several researchers have found that cooperative learning has more benefits than a traditional lecture style classroom. First, Yamarik (2007) taught two sections of macroeconomics—one with a traditional lecture style and one with cooperative learning. He found “that the experimental section scored four to six points higher on the combined exams when...[he] controlled for classroom, demographic, and academic factors” (p. 276). Furthermore, Yamarik (2007) speculated that students may enjoy working in cooperative learning groups more because it allows for more student-teacher interaction; students may address the teacher as a group which may be less intimidating than addressing the teacher

individually; it gives students a group to work and study with; and it can help increase students' interest in the subject. Kilic (2008) found a similar result when conducting his research between the traditional lecture style and the Jigsaw method, a form of cooperative learning. He found, similar to Yamarik, that the average success for students participating in cooperative learning was higher than the students participating in traditional teaching techniques, which is probably due to the fact that the students are actively learning the material, rather than just simply being told the information. Furthermore, Dat Tran (2014) found similar outcomes that cooperative learning achieved higher results, as compared to traditional teaching styles, when he conducted an experiment on whether cooperative learning or a traditional lecture style of teaching was more effective in the academic achievement of the students, despite the students beginning with similar knowledge bases.

Beyond academics, cooperative learning can provide additional benefits that may cause educators to favor the use of it even more. In a cooperative learning format, low achieving students are motivated and helped by their peers to increase their academic achievement, which may also increase their self-confidence and positive attitude towards school (Augustine et al., 1989-1990). Also, it is often questioned whether gifted students benefit from cooperative learning. Sometimes these students prefer to work individually because they can quickly complete assignments, but they may also not know how to work well with others. By working in a cooperative learning group, these students learn how to work with others, share ideas, and appreciate others' ideas and opinions. Plus, some students may benefit from working in cooperative learning groups if they are initially shy or intimidated by working with others; these students may learn how to be more assertive and manage conflicts that may arise when working with others. Cooperative learning may also enhance students' self-efficacy, which is the belief in

one's self that she can achieve a certain outcome (Gillies, 2003). Student's self-efficacy is often raised due to the encouragement and support of one's peers throughout the process of cooperative learning. Furthermore, students learn how to, and thus increase how much they give and receive help. According to Dugan et al. (1995), who completed research of a fourth-grade class that included two autistic students while using cooperative learning in the classroom, both the regular education students and the students with autism benefited academically and socially from the use of cooperative learning. Not only did the inclusion of the students with autism help the regular education students gain understanding of autism, the students with autism also gained social skills as they interacted more with their peers. Finally, by developing the skills needed to work in groups in school, students will be able to work more successfully in their future careers, as these are the skills sought after by employers.

In determining student groups, the teacher must consider the desired outcome of the groups (Mandel, 2003). In cooperative learning, the goal of the groups' formation is for students to learn from one another. As described in Scott M. Mandel's book *Cooperative Work Groups: Preparing Students for the Real World* (2003) if the goal of the cooperative learning group is understanding of the content, then the group should be composed of heterogeneous students. Greta K. Nagel in her book *Effective Grouping for Literacy Instruction* (2001) supports Mandel's claim that grouping should be heterogeneous for students to learn from one another and for students to gain motivation to learn and work hard. Mandel suggests that when grouping students according to their abilities, groups, if there will be five members in a group, should be composed of one high performing student, three average performing students, and one low performing student. Joseph S. Krajcik and Charlene M. Czerniak in their book *Teaching Science in Elementary and Middle School: A Project-Based Approach* (2014) explain that students learn

best when they are within their zone of proximal development, so student groups should be organized in such a way that students are working within this zone of proximal development to gain more knowledge or different perspectives. In addition, in deciding the composition of these groups, the teacher should work to avoid social conflicts within the groups, so that the groups remain focused on the academic task at hand, and work to consider other factors, such as gender, race, ethnicity, special needs, and multiple intelligences (Mandel, 2003).

Krajcik and Czerniak explain that teachers may choose to keep groups together for an extended amount of time or frequently change the groups. In support of keeping the same group together, Krajcik and Czerniak describe that students may begin to learn how each other work best within the group and a momentum may build among the group members to encourage greater work to take place (2014). If groups are often changed, students must relearn how each group member works and develop an understanding of how each group member learns each time the students are placed in a new group. However, Krajcik and Czerniak also argue that in order to keep student interest in the class and in the material, it is best to frequently change group members as “ideas may become stale in the [same] group and students eventually may learn all they can from each other” (p. 158, 2014).

Tony Lerma (2007) used cooperative learning study groups in his college mathematics courses in which students were placed in study groups for the duration of the semester. He found that due to the students’ participation in these groups, the students were more involved in class discussions and there was a higher retention rate for the class (Lerma, 2007). Students who worked with these study groups throughout the semester also reported more positive experiences about the class, an improvement in study skills, feeling more comfortable asking questions to their study group members, an increase in focus due to group members’ encouragement, an

improvement in learning due to helping each other, and the sense that they could count on their group members for help (Lerma, 2007).

In two construction management courses with 128 total students, Pranshoo Solanki and Nidhi Kothari (2014) compared three different cooperative learning grouping structures: individual selection by students, random selection by the instructor, and performance-based selection by the instructor. Pranshoo and Kothari (2014) found that the groups that were selected individually by students had the highest productivity and showed the most interest for lab projects. But, they found that students who were in groups that were randomly selected by the instructor or were selected by the instructor based on performance achieved more academically. Through the surveys, it was found that students were least satisfied in working with the randomly-selected groups and most satisfied in working with the individual selected groups. Finally, Pranshoo and Kothari found that all students thought working in groups, regardless of how the group was selected, was an interesting and positive experience.

Cooperative learning has the capability to not only improve students' academic knowledge, but also their social skills. These social skills that students may develop when working in cooperative learning groups are what will greatly benefit them throughout their future school and work careers. Furthermore, how students view group work and cooperative learning during early adolescence can be essential to how they view this method of learning in their future. Thus, it is essential for teachers to learn the best cooperative learning methods and structures and to appropriately incorporate them into the classroom, which will then help students achieve academically and socially.

## Methodology

This action research took place in two different fifth grade math and science classes in a rural elementary school. One was a typical fifth grade class, referred throughout the study as “Class 1,” and one was an inclusion class with twelve students having an Individualized Education Program (IEP) or 504 Plan, referred throughout the study as “Class 2.” Both classes learned math for about 90 minutes every day and learned science for about 35 minutes every day. The research took place in both academic areas. The study was conducted over several months from November to February. At the beginning of November, students began working in groups and discussions were held in class to determine the appropriate ways to work in groups. But, the surveys, which provided most of the data, were given within three days of one another at the end of February.

During the month of November, students were placed into different groups several times. For the first grouping, the students were randomly placed into groups and the groups completed stations about how to write decimals. Following this first time working in groups, a class discussion was held on what working in a group “Looks like” and “Sounds like” to help students determine the best strategies of working with a group, with a T-chart being created throughout the discussion highlighting what students should be doing in the groups so that the groups work as a cooperative learning group. Throughout the remainder of the study, students and I then referred to the chart in order to discuss whether the groups were following these guidelines that were established as a class. Following the creation of this chart, students continued to be placed into short-term groups that were based on ability throughout November. The short-term groupings were always created by the teacher. At times, the short-term groups were designed so that they had a mixture of high, middle, and low performing students in each group and at other

times the short-term groups were created by randomly assigning students to groups using a class list. But, if students were randomly placed in the groups and there was a potential behavior issue, the teacher changed the groups to eliminate this potential problem. Students completed both math and science activities in these short-term groups, and these short-term groups were used throughout the duration of the research study, with the members of each group always changing.

At the end of November, students' desks were changed from rows to table groupings. The setup of the classroom is shown in Appendix A. Due to the spacing of the classroom, some of the tables were quite large with six to seven students at each table. To combat this, students were given a designated home group, which was three to four students. These home groups were designed to be long-lasting. Students were placed in table groups based on ability, with groups being comprised of, or as close as possible to, a high performing student, a high-medium performing student, a low-medium performing student, and a low performing student. Students stayed in these table groups from the end of November through February, a total of three months. These long-lasting home groups were videotaped at random throughout their existence.

Throughout the duration of the research, students were typically instructed to work with their home groups on practice math problems during each lesson. If students were completing a station activity, students usually stayed in their home groups as they traveled to each station. In science, students often completed think-pair-shares, science activities, or science labs with their home groups. When students completed these cooperative learning activities in math and science, they were reminded about the guidelines discussed and created as a class concerning what working in a group "Looks like" and "Sounds like".

At the end of February, students were placed into short-term science groups based on ability, with once again the mixture of students in each group being a high, a high-medium, a

low-medium, and a low performing student, with four to five students in each group. No students were in the same group as someone in their home group. The groups completed a science lab about friction using carts rolling down a ramp with different surfaces. Students had completed similar labs with their home groups the previous week. Following the completion of this lab, students were given a survey, shown in Appendix B, about the group they had just worked in for science. In completing the survey, students were instructed to focus on how the group worked together for when they (1) found their data's average, (2) graphed the data, and (3) wrote the conclusion. Three days later, students took a survey about working in their long-lasting home groups after completing a math activity about converting customary and metric units of measurement in story problems, with directions that the students should answer the survey by thinking about how their home group worked together during the math activity and all other instances of working in their home groups. This survey is shown in Appendix C.

## **Results**

After students completed one group activity involving stations, students and I discussed what working with others “Looks like” and “Sounds like.” Figures 1 and 2 below show the different classes’ answers to these questions. The common answers between the two groups included discussions about helping each other through the problems and asking each other for help, staying on task, remaining positive and encouraging one’s group members, and discussing answers to reach the same final answer.

What does working with others...	
Look like?	Sound like?
<ul style="list-style-type: none"> <li>• Talking with each other</li> <li>• Asking questions</li> <li>• Discussing answers</li> <li>• Debate answers</li> <li>• Stay focused and on task</li> <li>• Not arguing</li> </ul>	<ul style="list-style-type: none"> <li>• Talking</li> <li>• Level 1 or 2 voice</li> <li>• Saying positive things to each other</li> <li>• Encouraging each other</li> <li>• Using name</li> <li>• "I'm confused. Can you help me?"</li> <li>• "What do you have for an answer?"</li> </ul>

Figure 1, Class 1

What does working with others...	
Look like?	Sound like?
<ul style="list-style-type: none"> <li>• Help others when they need help</li> <li>• Working with each other to get the same answer</li> <li>• Asking others for help</li> <li>• Everyone is doing the same amount of work</li> <li>• Everyone is participating equally</li> <li>• Paying attention</li> <li>• Stay on the same problem</li> <li>• Work as a problem</li> <li>• Be nice to others</li> <li>• Checking each other's answers</li> </ul>	<ul style="list-style-type: none"> <li>• Ask each other questions</li> <li>• Debate over correct answer</li> <li>• "Can you slow down?"</li> <li>• Noise level of 2</li> <li>• "You are doing good!"</li> <li>• Explaining how they solved it</li> <li>• On topic conversations</li> </ul>

Figure 2, Class 2

### ***Enjoyment of Working in Groups***

On the survey *Group Work Survey*, students were asked how much they enjoy working with their home groups. This survey, which was given three months after the students had been working in their home groups, indicated that the students were relatively split on whether or not they enjoyed working with their home group. Figure 3 illustrates that 22 out of the 46 students surveyed indicated that they enjoyed working with their home group at the time that the survey was given by selecting a 4 or 5 on the survey scale, six students remained neutral, and 18 students indicated that they did not enjoy working with their home group at the time that the survey was given by selecting a 1 or 2 on the survey scale. Thus, this survey shows that after working in their home groups for three months, 48 percent of the students continued to enjoy working with their home group and 39 percent of the students did not enjoy working with their home group, with 13 percent of the students being neutral.



Figure 3

According to the question “On a scale of 1 to 5, how much did you enjoy working with your group in science?” on the survey *Working in Different Groups*, 34 of my 50 students (68 percent) indicated a high level of enjoyment in working with their science group, as they selected either 4 or 5 on the survey scale; four students (8 percent) were neutral in their answer; and 11 students (22 percent) indicated a low level of enjoyment in working with their science group, as they selected a 1 or 2 on the survey scale. This data is shown graphically in Figure 4 below.



Figure 4

However, when reviewing the comments that were provided for the above question, ten students expressed having a positive experience in working with their short-term science group, 11 students expressed having a negative experience in working with their science group, and 29

students did not write any comments. So, if only the comments are looked at for the feedback on the level of enjoyment in working in the science group, the comments appear to illustrate a different picture than the data from the survey, as 68 percent of the students on the survey question indicated that they enjoyed working in their science group but just 47 percent of the students who made comments explained that they had a positive experience in their science group. However, with such a large number of students not commenting at all on their level of enjoyment, the percentages established from the comments should probably not be relied upon. But it is noted that the students who did comment favorably explained that they liked these science groups because of the other students they were with or because of the act of working in groups in science. Some of the comments these students said include the following:

- I would really like to work in that group again.
- I love going into random groups. It's fun.
- I have a good group.
- I loved working with my group.

And for students who had a negative experience in working with their science group, they oftentimes described in their comments a negative situation taking place, with comments such as the following:

- My group somewhat drove me crazy.
- I really don't like to be in a group with Alex, he is way too bossy!
- I didn't get to roll the jeep or [use] the calculator.

### ***Cooperative Learning and Enjoyment of Group Work***

Of the 21 students who made comments for this question of "What other comments do you have about working in your science group?" on the *Working in Different Groups* survey, 15

students described whether or not the group was working collaboratively together. The other 6 students who commented did not make comments that were pertinent to the question. But for the students who commented favorably about their group working collaboratively, their comments included the following:

- We all worked together and didn't argue.
- Everyone did their part.
- I liked working in groups especially with people who help me (Kris, Alison).
- If our group had a problem we overcame it.

And for the students who included comments describing that the group did not work well together, their comments included the following:

- Two of the people didn't listen and tried doing all the work by themselves.
- When I was working in my group Caden and Alex didn't let Cailin, Riley, or me know anything like measuring or letting the jeep fall down the ramp.
- Brie was not paying attention.
- Sometimes people in my group don't want to do anything and just expect me to do all of it because I'm smart as they say.

Figures 5 and 6 relate the cooperative nature of a student's group to how much the student enjoyed working in their science group. Out of the seven students who made comments describing the group as working collaboratively, only one student stated that he/she did not enjoy working in his/her science group. On the other hand, out of the eight students that stated that they did not enjoy working with their science group, six students indicated through their comments that their group did not work collaboratively. This data illustrates that for the students who indicated that they enjoyed working with their science group, a large majority of them used

cooperative learning strategies. But for the students who commented that they did not enjoy working with their science groups, a majority of them described a group that did not use the cooperative learning strategies that were discussed as a class.

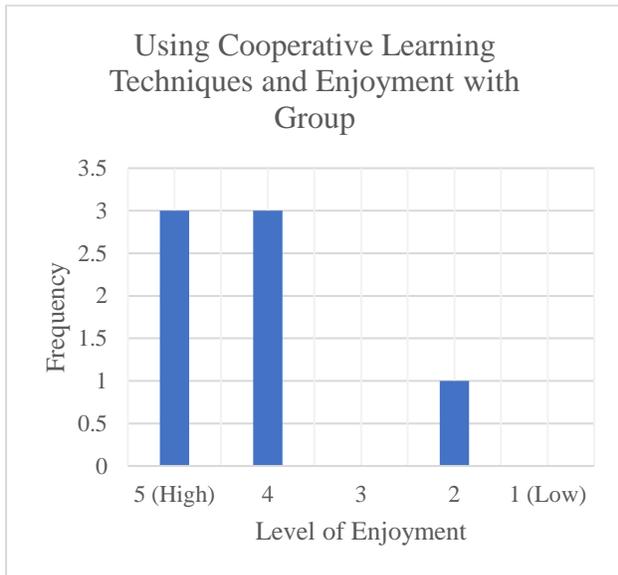


Figure 5

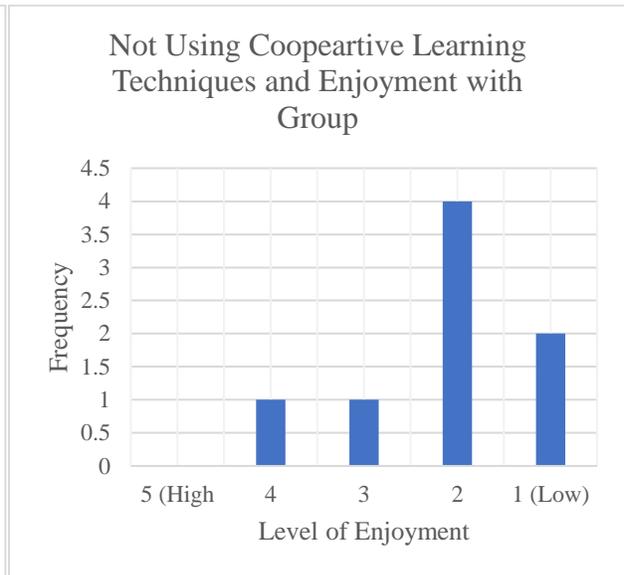


Figure 6

***Satisfaction of Working with Home Group Over Time***

On the *Group Work Survey*, students answered the question “Does your group work better together now that you have been working together for so long?” Figure 7 below illustrates the results graphically. Out of the 46 students surveyed, 19 students believed that their home group does not work as well after working together for three months, which is 41 percent of the students, and 27 students believed that their home group does work better after the three month time period, which is 59 percent of the students.

Students then explained their answer to this question through a written response on the survey. Some of the comments the students made regarding why they do not work as well together after the extended time period as they did before are the following:

- We can never agree on answers and people don’t pay attention.

- Because we fight over who is correct or not.
- They still don't help.
- I don't like working with the same people because it is boring and they yell at me a lot.

The comments students made describing why their home group works better following the three month time period include the following:

- We have gotten better at working together because we have gotten to know each other better.
- We have been helping each other more.
- Because Joslyn was answering all the questions now everyone is.
- Leroy didn't cooperate as well than now. He is working with us instead of us giving him answers.

Thus, students indicated through their selected responses and their comments that a small majority of students believe that their home group is working better after the three month time period than when the group was first formed.

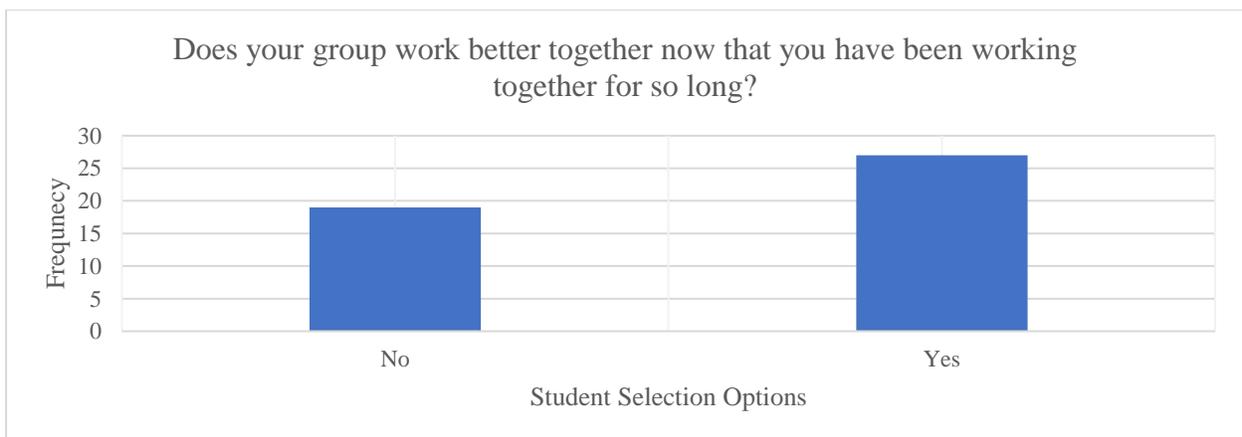


Figure 7

### *Helping Group Members*

Students were asked a question in both surveys on how much they help their group members. On the survey *Working in Different Groups*, students responded to the question “On a scale of one to five, circle how much you agree with this statement: I helped my group members with questions they had.” In response to this question, 42 out of 50 students indicated that they did help their group members with questions by either selecting a 4 or 5 on the survey scale, five students remained neutral, and three students indicated that they did not greatly help their group members when they had questions by selecting a 2 on the survey scale. Figure 8 below indicates that 84 percent of the students helped answer their science group members’ questions during the science lab and 6 percent of the students did not greatly help their science group members with questions they had during the science lab.

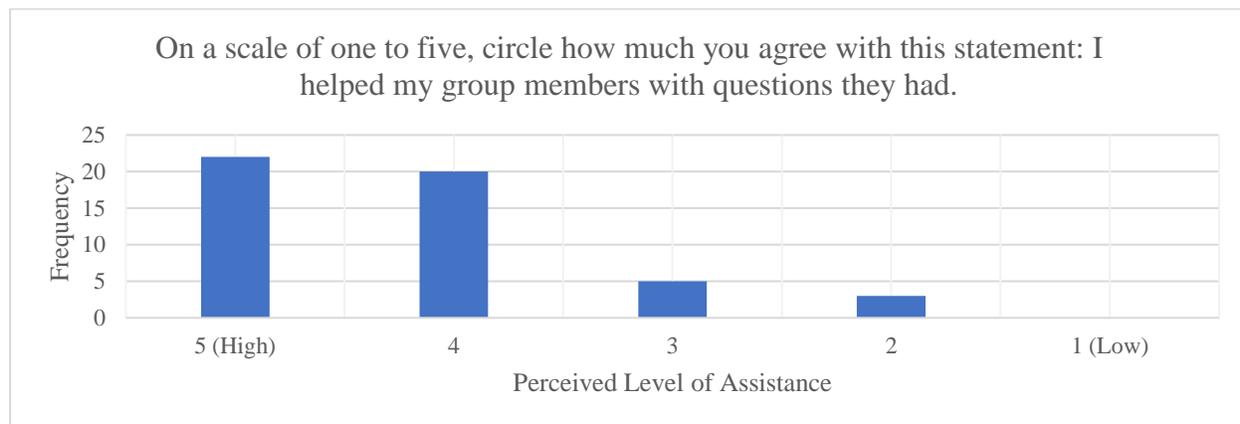


Figure 8

A similar question was asked on the *Group Work Survey* that was given to students regarding their home groups. Figure 9 below shows this data graphically. According to the survey, 37 out of 46 students indicated that they helped their home group members when their group members had questions by selecting a 4 or 5 on the survey scale, which is 80 percent of the students. Seven students remained neutral in answering this question, and two students

indicated that they did not greatly help their home group members when they had questions by selecting a 2 on the survey scale, which is 4 percent of the students.

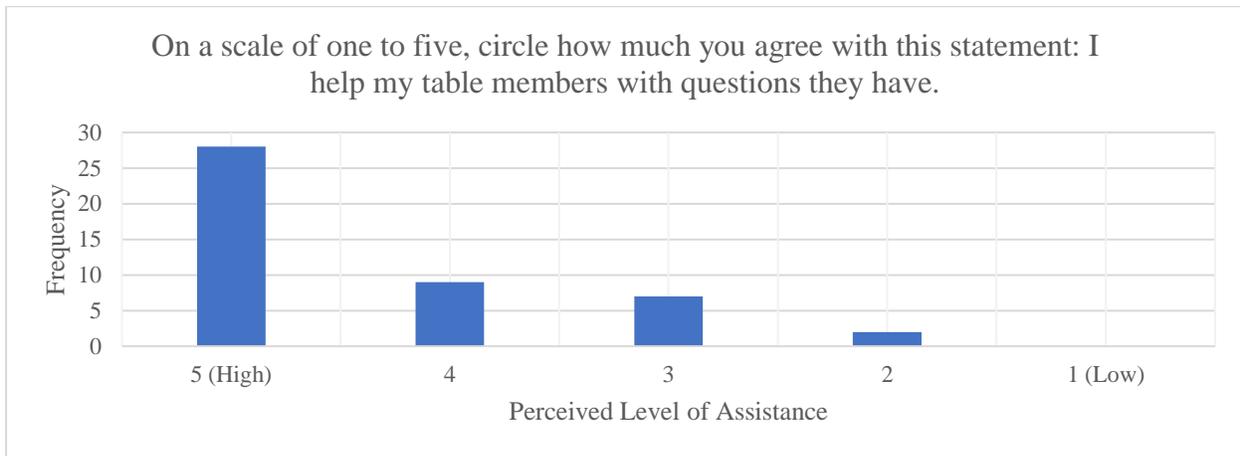


Figure 9

### ***Comfort in Asking for Assistance from Group***

On the survey *Working in Different Groups*, students were asked the question “On a scale of one to five, circle how much you agree with this statement: When I worked with my science group, I felt comfortable asking my group members questions I did not understand.” The results from this question are illustrated below in Figure 10. According to this data, 39 out of the 50 students surveyed indicated with a selection of a 4 or 5 on the survey scale that they felt comfortable asking their science group members questions, four students remained neutral, and seven students did not feel comfortable asking their science group members questions through their indication of a 1 or 2 on the survey scale. According to this data, 78 percent of the students felt comfortable asking their science group members questions if they did not understand and 14 percent of the students did not feel comfortable asking their science group members questions.

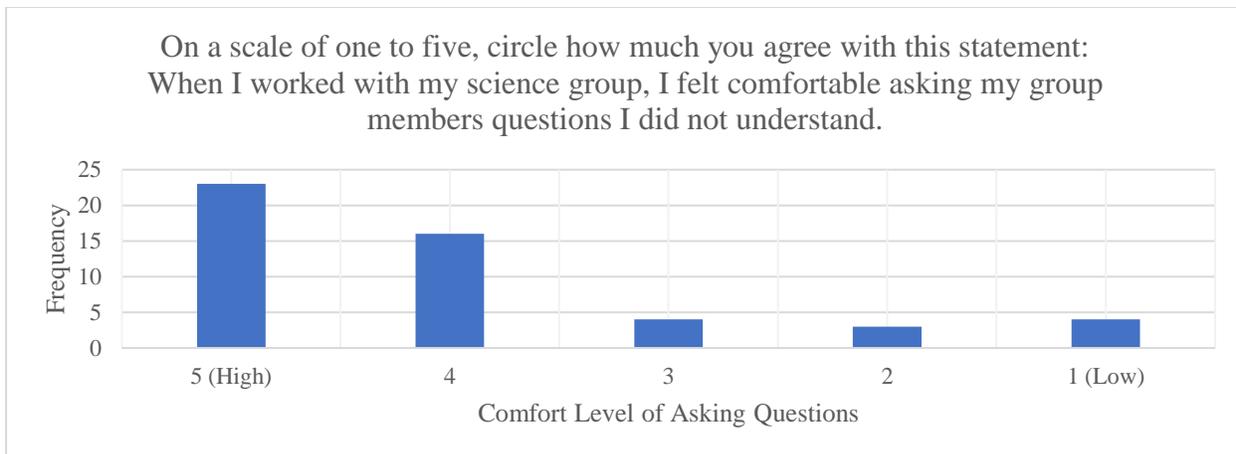


Figure 10

Students were asked a similar question concerning their home groups on the *Group Work Survey*. In this survey about the students working together in their home groups, 38 out of the 46 students surveyed indicated that they feel comfortable asking their home group members questions if they did not understand a concept by selecting a 4 or 5 on the survey scale, four students remained neutral in answering the question, and four students indicated that they did not feel comfortable asking their home group members questions if they did not understand. This data is represented graphically in Figure 11. Thus, 83 percent of the students felt comfortable asking their home group members questions and 7 percent of the students did not feel comfortable asking their home group members questions if they did not understand something.

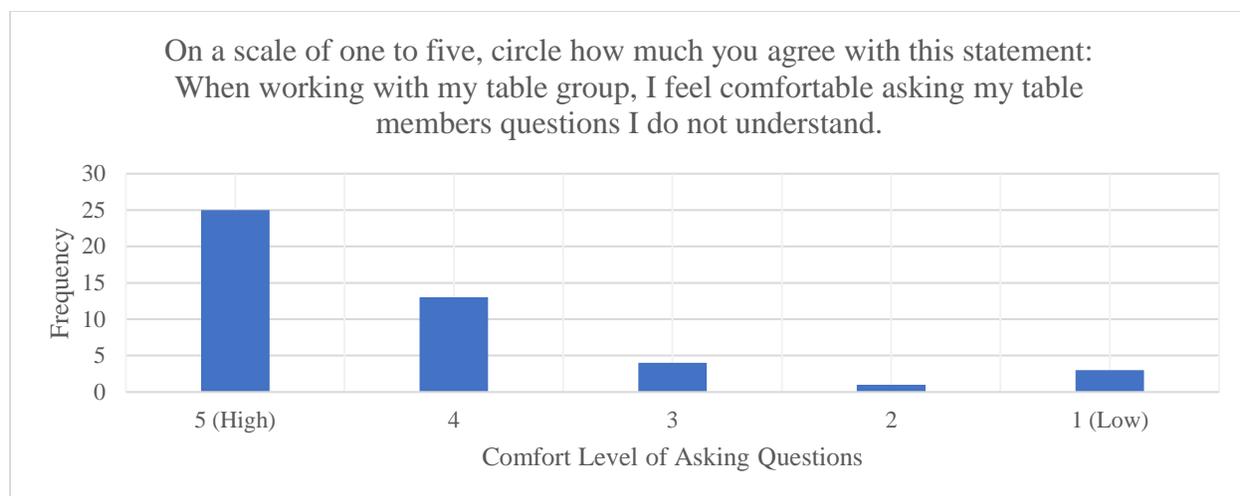


Figure 11

***Areas for Improvement in Working in Home Groups***

In this same survey about home groups, students were asked to complete the following sentence: “I think I would feel more comfortable to help my table members if...” which helped give insight into the issues the groups were still having. Out of the 45 comments, nine students (20 percent) stated that they already felt comfortable working with their home group and that there was nothing that their group could improve on. However, there were comments by others on how to improve the comfort level of the individuals in the groups. Some of the largest areas of suggested improvement for the home groups that were commented on are as follows: (1) improving how the group members respond to one another, such as being nicer, not fighting, and working more as a group; (2) helping each other or group members complete more of the group work, rather than relying on one or two people in the group to do the work; (3) decreasing negative classroom behaviors, such as not paying attention, not listening, or horse playing; or (4) having a stronger self-esteem in themselves. Nine students (20 percent) believed that their group could improve on how the group members respond to one another, ten students (22 percent) believed their group could improve on helping each other more and completing the work more

evenly, six students (13 percent) believed their biggest area of improvement was decreasing the number of negative classroom behaviors, and three students (7 percent) believed their groups largest need of improvement related to their own self-esteem.

Students were asked a similar question later in this survey of “What are some things your group could improve on to work better together?” Students were varied in their responses to this question on how their group could improve. Out of the 43 students who answered the question, five students (12 percent) believed that their group worked well together and that there was nothing for the group to improve on. Eleven students (26 percent) indicated that their group needed to work on focusing more on the work at hand or to stop “playing around.” Twenty students (47 percent) explained that their group needed to improve on working together more, such as staying on the same problem, helping others in the group, discussing the work together, or one person not completing all the work. Eight students (19 percent) explained that their group needed to improve on not fighting with one another and being nicer to one another in the group. And four students (9 percent) indicated that their group members needed to listen better to one another.

### ***Learning from and Teaching Group Members***

On the *Group Work Survey* students were asked to list one example of something they learned from their group members. Out of the 40 comments made that related to the question being asked, students included a variety of examples of what they learned over the course of the three months they spent with their home group. Figure 12 below represents these results graphically. Eleven students (25 percent) explained a positive behavior they learned from working in the group, such as asking questions, paying attention, listening, not guessing, and how to work in groups better. Eleven other students (25 percent) indicated that they learned how

to solve a specific problem from their group members. Eleven students (25 percent) commented about the content that they had learned from their group members, such as “how to compare mixed units,” scientific explanations of the lab results, “how to add fractions” and “communitive [property] is like a neighborhood it just switches around.” Five students (12.5 percent) indicated that they learned to appreciate others that they were working with by using statements such as the following:

- I learned that we all know different things.
- I have to work slow with them.
- I learned that they are comfortable asking questions.

Finally, two students (4.5 percent) stated that they did not learn anything from their home group members.

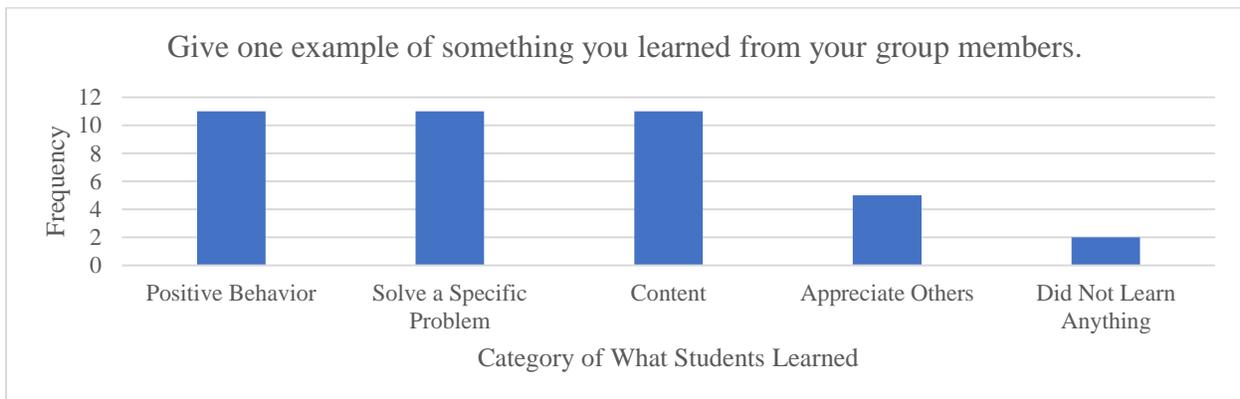


Figure 12

When students were asked the question “Give one example of something you taught someone in your group” on the *Group Work Survey* about working in home groups, students had similar groupings of answers as they had when asked “Give one example of something you learned from your group members.” This data is shown in Figure 13 below. Six out of the 39 students who answered this survey question (15 percent) indicated that they taught their group

members a positive classroom behavior, such as paying attention, “to not goof around,” “to read closer,” and “kindness.” Thirteen students (33 percent) explained that they taught their group members how to do a specific problem. Seventeen students (44 percent) indicated that they taught their home group members a concept, such as “how to get a mixed number to be an improper number,” “if the ramp is higher the jeep will go farther,” “how to convert better,” and “adding and subtracting fractions.” One student indicated that they taught their group members that “I’m not the only smart one.” And, two students (5 percent) indicated that they did not teach anything to their group members.

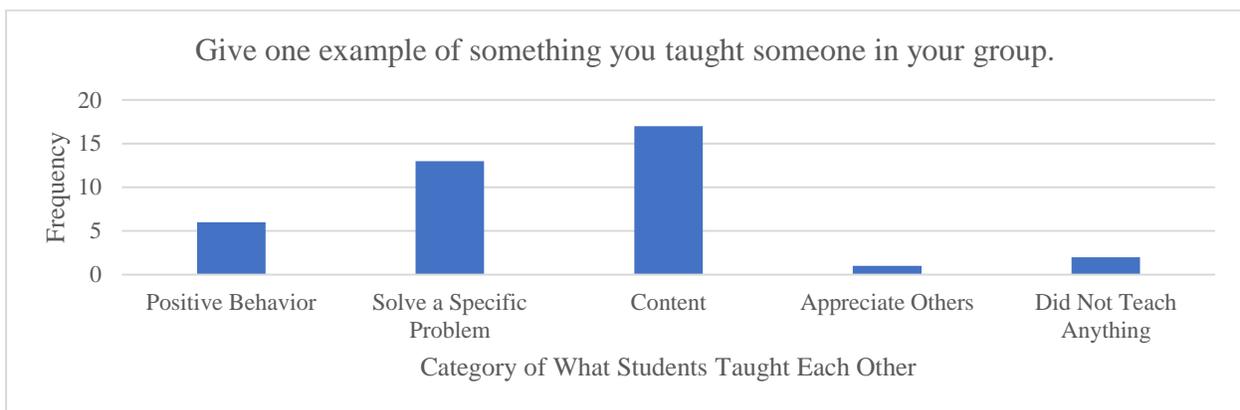


Figure 13

### Discussion

My research on cooperative learning did not support my hypothesis that students would enjoy working in long-lasting and set groups (their home groups) more than they would enjoy working in short-term groups (their science group) because a majority of the students enjoyed working in both types of group structures. In fact, more students selected that they enjoyed working with their science group on the survey *Working in Different Groups* than the number of students that selected that they enjoyed working in their home group on the *Group Work Survey*.

In order for cooperative learning to take place, Johnson and Johnson (1999) explain that the teacher must create an environment that is conducive to this type of learning. To establish an appropriate environment in the classroom and within each group, the students and I discussed what cooperative learning “Looks like” and “Sounds like” in a T-chart to help guide students to use appropriate strategies when working with others. In making the T-chart, the students and I discussed characteristics of cooperative learning groups that are described in research by Johnson and Johnson (1999) and Slavin (2010), such as discussing the assignment as a group, helping one another understand the concepts, and encouraging one another.

Throughout the research, I reminded the students of this T-chart that we made as a class and what we decided as the appropriate ways to work as a group. As students had not worked extensively in groups before, it was important to have this continuing discussion with students for them to recognize that they were no longer just working by themselves, but that they were now working with a group towards a common goal.

Due to my students needing to first understand the characteristics of cooperative learning, the purpose of the discussion on how to appropriately work in cooperative learning groups was to introduce the concept of cooperative learning and to encourage students to implement the principles of cooperative learning by moving away from simple group work. In addition, even though the characteristics of cooperative learning were examined through this discussion, students then needed to develop skills to effectively work as a collaborative group, which was practiced throughout the duration of the research due to the variety of lessons that utilized cooperative grouping strategies.

Overall, the students enjoyed working in both types of groups. In comparing the answers on both surveys in how much each student enjoyed working with their short-term science group

and how much each student enjoyed working with their long-lasting home group, twenty percent more students indicated that they enjoyed working with their science group. The data from both surveys in regards to the questions “How much did you enjoy working with your group in science?” and “How much do you enjoy working with your [home] table group?” indicates that while many of the students enjoyed working in each group respectively, there is still a significant minority of students that indicated that they did not enjoy working with a specific type of group. Thus, it is important to be cognizant as a teacher to understand the students’ thoughts towards working in their various groups so that appropriate intervention can take place, if needed.

Furthermore, the students’ abilities to appropriately perform cooperative learning, and not group work, may have also impacted their enjoyment in working with each type of group. Because cooperative learning surrounds everyone in a positive light, with each student having a responsibility to complete a common group goal, students may approach working in these cooperative groups more positively. But due to non-cooperative learning groups having a more individualistic approach, students may not enjoy working in these types of groups, as there is not as much of a supportive environment. Most students who included comments on the *Working in Different Groups* survey that described a group that completed work that was not cooperative in nature indicated that they did not enjoy working with that particular group. But most students who described a more cooperative learning group in their comments indicated that they did enjoy working in that group. Thus, the use of cooperative learning is beneficial in that students enjoy working in these types of groups more than groups that do not utilize cooperative learning.

In analyzing the comments made by the students about working in various groups, it is evident that some groups were participating in cooperative learning groups, but other groups were completing work that was more similar to group work. Johnson and Johnson (1999)

describe that cooperative learning includes students working together towards a common goal. In most instances when my students completed cooperative learning, in both the home groups and the science groups, the goal was for everyone to improve their understanding of the material. It is evident that some groups were performing cooperative learning due to the comments they made in the surveys. Through my observations in class, I also saw students working collaboratively as they worked to help one another understand the material and asked their peer members questions to guide them to the answer, rather than telling their group member the answer.

However, it is clear through the comments made on the surveys and through my observations that some students and groups did not follow the prescribed suggestions that were discussed in the T-chart in working as a cooperative group. Some of the major issues that were found among the groups that impeded the students from working as cooperative learning groups were that students were not always motivated to help their group members when they had questions and that students wanted to be free riders and not complete the work that was asked of them.

But, as students continued to work in home groups, students improved in their willingness to help one another. This was shown in the data from the *Group Work Survey* about whether the students' groups improved after working together for a long time. The majority of students indicated that their group worked better following the three-month time period of working together. This willingness to help one another is surmised to be a result of the students getting to know each other better. In addition, the students were able to learn each other's strengths and weaknesses, gain a better understanding of each other, and develop friendships.

Nevertheless, a large minority of students indicated that they did not enjoy working with their home group following the three-month time period. It is hypothesized that these students

worked in groups that may not have utilized the cooperative learning strategies discussed, as it was found that the students who enjoyed working with their groups tended to use cooperative learning strategies. And so, even though these cooperative learning strategies were taught and discussed throughout the time period that the students worked in groups, some students did not use the strategies discussed to help them work as cooperative learning groups.

With the hypothesis about students not enjoying group work because they did not use cooperative learning strategies, and the comments made and the data collected throughout both surveys, it is evident that more intervention is needed to help guide more students in using cooperative learning strategies in their groups. With additional guidance and direction, then all groups, no matter if the group is a home group or a short-term group, may move towards working more collaboratively together, with all groups reaching the ultimate goal of working as a cooperative learning group.

While I used a T-chart and discussions to help students understand how to work in cooperative learning groups, it is clear that not all of the students embraced the idea of working as a cooperative learning group. So, future research should investigate the most effective strategy to teach cooperative learning for students to then embrace the concept of cooperative learning, which will then lead to the use of cooperative learning in their future groups, with the goal that the students will continuously use cooperative learning throughout the remainder of their school years and work careers.

In addition, it is questioned whether there would have been similar results for either survey had the survey been given at a different time in the research or to students when they were in a different group structure. For example, would students have answered similarly on the *Working in Different Groups* survey following the first time they worked with their home group?

Or, would students have responded similarly on the *Group Work Survey* if they remained in their science groups for an extended amount of time and answered this survey in regards to working with this group? Thus, further investigation should take place to learn whether there is an ideal amount of time that groups should remain together, if there are ideal activities that are better suited for short-lasting student groups or for long-lasting groups, and if there is an ideal way to group students for them to improve academically.

Other factors that may have influenced how much the students enjoyed working with a particular type of group are (1) how comfortable the students feel asking their group members questions and (2) how much the students help their group members. Both of these questions were asked on the surveys, and there was a high percentage of students on both surveys who agreed that they did help their group members when they had questions and they felt comfortable asking their group members questions. In comparing the two surveys, a slightly higher percentage of students indicated that they helped their group members in the science groups when their group members had questions, and a slightly higher percentage of students indicated that they were comfortable in asking their home group members questions if they did not understand. But, the percentage of students who indicated feeling comfortable in asking their group members questions and who helped their group members did not greatly change based on the type of group structure that was being utilized in the lesson.

In the home group survey, students were also asked what would make them more comfortable in working with their home group. It is important for the students to recognize what is not working in their group so that they can continue to work to improve this component of their group. The comments the students made in response to this survey question were narrowed into four categories, which are the following: (1) improving how the group members respond to

one another; (2) helping group members complete more of the work so that the group is not relying on one person; (3) decreasing negative classroom behaviors; and (4) having a stronger self-esteem in the work that they complete. The first two categories listed reflect ineffective cooperative learning groups that are not following the cooperative learning group structure. Thus, these comments are a further indication for the need of an intervention that would remind the students how to work in a cooperative learning group.

Through my observations, it was clear that some students have developed friendship and learning bonds with their home group members, which Yamarik (2007) predicted would occur when he observed in his research that cooperative learning groups provide students a group to work and study with. For example, two students have developed a strong friendship and learning bond because of the extensive work they have completed through their cooperative learning home group. The higher performing student constantly asks the lower performing student questions to guide her to the answer. In addition, when the lower performing student must make up work, she often asks the higher performing student to help her in learning this material, which is due to the bond that has been created throughout the year in their home group.

Furthermore, a more positive environment has been created in the classroom in that students motivate each other to succeed, which Augustine et al. (1989-1990) suggested would occur. I often see my students giving each other high-fives and providing positive comments in encouraging each other. It has been evident through my observations that many low performing students in my classes are motivated to learn and perform well because of the positive influence the higher performing students have on the lower performing students in their home groups.

As indicated by the comments made on the *Group Work Survey*, students learned from one another in working with their home groups, whether it be the learning of content, an

understanding of how to solve a specific problem, an appropriate classroom behavior, or a better understanding of their classmates which helps them work with their classmates better. In their reflections, the majority of students indicated that they learned either a positive classroom behavior, the general content, or how to solve a specific problem from their home group members. The categories that most students indicated that they learned something in were positive behavior, solving a specific problem, and understanding the general content. These comments students made about learning something from their home group support the Dugan et al. (1995) research in that students learn from one another in a variety of formats. And, my lower performing students even indicated that they learned positive classroom behaviors, such as paying attention, in addition to learning the content better. These positive classroom behaviors will be greatly beneficial for my students as they advance in their education and eventually in their future careers.

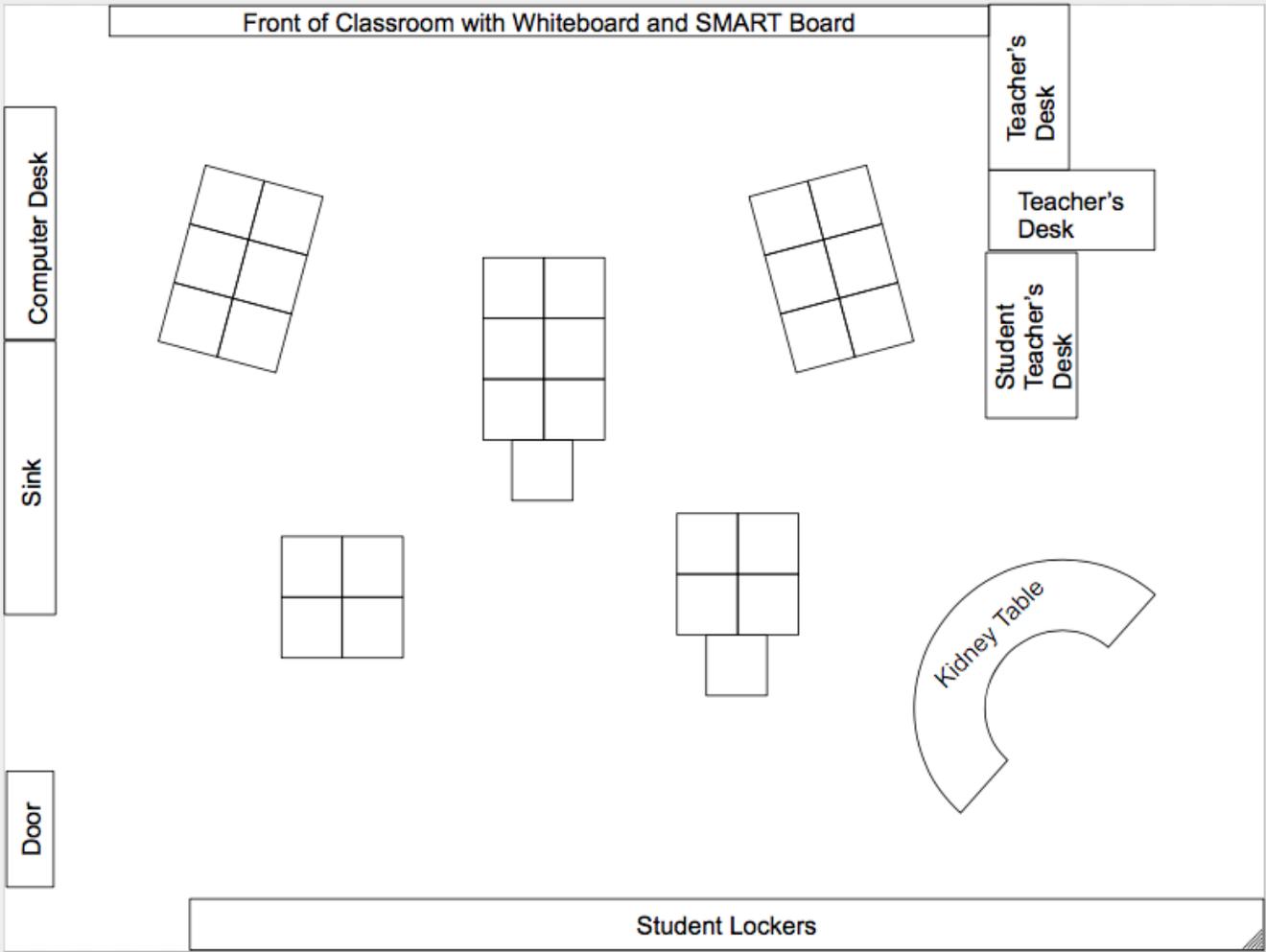
Furthermore, it is evident that most students recognized that they taught something to their group members, as established from the survey results. And what students taught one another could be placed into similar categories for what they learned from one another, with those categories being (1) positive classroom behavior; (2) how to solve a specific problem; (3) a greater understanding of the content; and (4) appreciation of others. And as to the categories taught, the majority of students indicated that they taught their group members how to solve a specific problem or a more general content matter.

While it is evident that students developed bonds within their home groups and students understood the strengths and weaknesses of their home group members, students greatly appreciated the opportunity to work with different people in their science group. Thus, it is concluded that students should work with a home group in order for students to have a constant

group of students that they may work with and ask questions to, but students should also be given the opportunity to work with others in randomly assigned groups that last for a short amount of time. As suggested by Krajcik and Czerniak (2014), by randomly assigning students into groups, whether it truly is random or by students being placed in groups at the discretion of the teacher, the group activity may better spark the students' interest because they are working with new people.

Also, while my students improved in their capabilities for working in groups by implementing some of the suggestions made at the beginning of the research, it is clear that some students still need to develop their cooperative group skills. Thus, it is important as a teacher that I continue to monitor the students' abilities in implementing these positive cooperative learning skills and to provide additional activities throughout the duration of cooperative group work to reinforce the appropriate ways students should work together in groups.

Appendix A



Appendix B

### Working in Different Groups

1. On a scale of 1 to 5, how much did you enjoy working with your group in science?

I loved it!      5      4      3      2      1      I did not like it.

2. On a scale of 1 to 5, do you prefer to work in groups that are different every day or work in the same group every day?

Always work in the same group      5      4      3      2      1      Change groups every day

3. Do you think your regular table group works better together or your random science group?

Regular Table Group      5      4      3      2      1      Random Science Group

4. On a scale of one to five, circle how much you agree with this statement: When I worked with my science group, I felt comfortable asking my group members questions I did not understand.

I felt really comfortable!      5      4      3      2      1      I did not felt comfortable.

5. On a scale of one to five, circle how much you agree with this statement: I helped my group members with they questions had.

Helped my group members multiple times      5      4      3      2      1      I never helped my table members

6. Circle the option that best describes you: When making the graph and writing the conclusion, how many people did you mostly work with in your science group?

I worked by myself.

I worked with one other person.

I worked with two other people.

I worked with everyone in my group.

7. On a scale of one to five, circle how much you agree with this statement: When working in a group, I do most of the work and my group members do not do much work.

I do all of the work.      5      4      3      2      1      My group members do all of the work.

What other comments do you have about working in your science group? \_\_\_\_\_

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When I help my table members,

- A. I just give them the answers
- B. I ask them questions to lead them to the answer
- C. I let them write all the answers
- D. I take their pencil and write for them
- E. I do not help my table members

9) When working with my table members, I usually...

- A. Do all of the talking
- B. Talk most of the time
- C. Sometimes talk
- D. Never talk

10) On a scale of one to five, how well do you listen to your table members?

I listen very well.      5      4      3      2      1      I do not listen.

11) Give one example of something you learned from your group members. \_\_\_\_\_

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12) Give one example of something you taught someone in your group. \_\_\_\_\_

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13) What are somethings your group could improve on to work better together? \_\_\_\_\_

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Augustine, D.K., Gruber, K.D., & Hanson, L.R. (1989-1990). Cooperation Works! Brandt, R.S.

(Ed.), *Cooperative Learning and the Collaborative School: Readings from Educational Leadership* (pp. 52-55). Retrieved from [http://files.eric.ed.gov/full\\_text/ED342108.pdf](http://files.eric.ed.gov/full_text/ED342108.pdf)

Brandt has written several books about education and was the assistant executive director of the Association for Supervision and Curriculum Development. Augustine, Gruber, and Hanson are sixth, third, and fourth grade teachers, respectively, at Dayton Elementary School in Anoka-Hennepin School District. The authors discuss that cooperative learning is beneficial for all levels of learners, including high, low, and middle level achieving students. The article supports the concept that cooperative learning is beneficial in different ways for different students, but all students are able to benefit from the use of the cooperative learning technique. Also, the authors explain that students may benefit from cooperative learning both academically and socially.

Brame, C.J. & Biel, R. (2015). *Group work: Using cooperative learning groups effectively*.

Retrieved from <http://cft.vanderbilt.edu>.

Brame is the Assistant Director and Biel is an undergraduate intern for the Center of Teaching at Vanderbilt University. The authors discuss the basics of cooperative learning by providing structural examples of cooperative learning, the theory behind the use of cooperative learning, and evidence of the effectiveness of cooperative learning. This article helped determine why cooperative learning is effective, which is due to the nature of cooperative learning following Lev Vygotsky's sociocultural theory.

Dat Tran, V. (2014). The Effects of Cooperative Learning on the Academic Achievement and Knowledge Retention. *International Journal of Higher Educaiton*, 3(2), 131-140. doi: 10.5430/ijhe.v3n2p131

Dat Tran is a faculty member of education at An Giang University in Vietnam. He describes the study he completed with first year college students that either were taught with traditional teaching or with cooperative learning. He found that after 8 weeks of using the different methods, those taught with a cooperative learning method achieved higher. The author demonstrates that students may successfully adjust to this new teaching style within a relatively short period of time.

Davidson, C. N. (2012). *Now You See It: How the Brain Science of Attention Will Transform the Way We Live, Work, and Learn*. Retrieved from <http://raley.english.ucsb.edu/wp-content/uploads/234/CDavidson.pdf>

Davidson is a professor at Duke University and writes for the Washington Post, Harvard Business Review, Wall Street Journal, and Inside Higher Ed. In her book she discusses the importance of transforming our schools and businesses to better serve the current needs of society. She emphasizes how much our society is changing to be more technologically based and that we, as a society, need to adjust to these changes appropriately, which supports the notion that teachers need to change how they teach in order to comply with these changes in society.

Dugan, E., Kamps, D., Leonard, B., Watkins, N., Rheinberger, A., & Stackhaus, J. (1995).

Effects of Cooperative Learning Groups During Social Studies for Students with Autism and Fourth-Grade Peers. *Journal of Applied Behavior Analysis*, 28(2), 175-188. doi: 10.1901/jaba.1995.28-175

Dugan, Kamps, and Leonard are faculty at University of Kansas and Watkins, Rheinberger, and Stackhaus are faculty members at Kansas City Public Schools. The authors describe a study they completed in which they integrated students with autism

with their regular classroom peers using the technique of cooperative learning. They found that in doing so, both groups of students—the regular classroom peers and the students with autism—benefited socially from the integration of the students with autism due to the cooperative learning technique because both groups of students learned how to better interact with their peers. The article discusses that cooperative learning has further benefits other than just academics.

Gillies, R.M. (2003). The effects of cooperative learning on junior high school students during small group learning. *Learning and Instruction, 14*(2), 197-213. doi: 10.1016/S0959-4752(04)00068-9

Gillies is a faculty member of the School of Education at The University of Queensland in Australia. She completed research with middle school students and analyzed the effect of structured and unstructured groups within the realm of cooperative learning. She found that students in cooperative learning groups that were structured were more successful. This study confirms that students in the early adolescence range can be successful with the cooperative learning method, but they need to have structured guidance in how they should work within the group.

Johnson, D.W. & Johnson, R.T. (1999). Making cooperative learning work. *Theory Into Practice, 38*(2), 67-73. doi: 10.1080/00405849909543834

Johnson and Johnson describe what cooperative learning is and what it entails. The authors also explain what elements must be included in the structure of the classroom and lesson to ensure cooperative learning takes place. Furthermore, Johnson and Johnson describe the benefits of cooperative learning. David W. Johnson and Roger T. Johnson are the Co-Directors of the Cooperative Learning Center. David W. Johnson has an Ed.D.

in social psychology from the Teachers College at Columbia University, and Roger T. Johnson holds a doctoral degree from the University of California in Berkeley.

Kilic, D. (2008). The Effect of the Jigsaw Technique on Learning the Concepts of the Principles and Methods of Teaching. *World Applied Sciences Journal*, 4(1), 109-114. Retrieved from [http://idosi.org/wasj/wasj4\(s1\)/18.pdf](http://idosi.org/wasj/wasj4(s1)/18.pdf)

Kilic is a faculty member of education at Ataturk University in Turkey. He describes his study comparing the jigsaw method of cooperative learning and the traditional lecture style of teaching. He found that the cooperative learning style is more effective than the traditional method. He speculates that the jigsaw method helps students remember the material better because they are actively involved in the learning. The article is important to consider as it emphasizes the benefits of cooperative learning.

Klaus, P. (2010). Communication Breakdown: Why don't our colleges teach interpersonal communication skills? Retrieved from <http://www.cajobjournal.com/articles/communication-breakdown?A=WebApp&CCID=14608&Page=3&Items=3>

Klaus is considered a workplace communication and leadership expert, as she has taught several training programs, delivered keynote speeches, and coaches executives of top corporations and organizations. The author explains the importance of soft skills in the workplace. Klaus describes how the use of soft skills can be used throughout one's career.

Krajcik J.S. & Czerniak, C.M. (2014). *Teaching Science in Elementary and Middle School: A Project-Based Approach*. New York, New York: Routledge Taylor and Francis Group. At Michigan State University, Krajcik is a Professor of Science Education and the Director of the Institute for Collaborative Research in Education, Assessment and

Teaching Environments for Science, Technology, Engineering and Mathematics (CREATE for STEM). Czernick is a Professor of Science Education at the University of Toledo. The authors describe how to implement project-based learning in the science classroom. In addition, the authors explain why students would prefer various structures in grouping students for cooperative learning groups. Thus, their research is valued in that it provides suggestions in how to organize cooperative learning in the classroom.

LearnNTEach2712. (2012). Reading-Week 3. Kagan 6 Key Concepts. Retrieved from <https://learnnteach2712.wikispaces.com/Reading+Week+3.+Kagan+6+Key+Concepts>  
This article summarizes Spencer Kagan's theory of the six key concepts needed for cooperative learning to be successful. This is a useful resource because it describes another theorist's principles that must be included for effective cooperative learning to take place. It is important to recognize the different elements that need to be included in cooperative learning to ensure the chosen cooperative learning technique will be successful.

Lerma, T. (2007). Cooperative Study Groups: Give Your Students the Home Team Advantage. *NADE Digest*, 3(2), pp. 13-22. Retrieved from <https://eric.ed.gov>.

Lerma is a mathematics associate professor at the University of Texas at Brownsville and Texas Southmost College. The author conducted research over three semesters with two of his College Algebra classes in which he assigned students to study groups. This research is valuable as it describes the students' positive and negative experiences in working with the same group of students throughout an entire semester.

Mandel, S.M. (2003). *Cooperative Work Groups: Preparing Students for the Real World*. Thousand Oaks, California: Corwin Press, Inc.

Mandel has a Ph.D. in Curriculum and Instruction from the University of Southern California, and he has been recognized as a National Board Certified Teacher. Mandel describes how to effectively use cooperative learning groups to prepare students for the work force by developing twenty-first century skills. This resource is particularly valuable as Mandel describes the importance of heterogeneous groups and how to create heterogeneous groups based on ability.

Nagel, G.K. (2001). *Effective Grouping for Literacy Instruction*. Boston, Massachusetts: Allyn and Bacon.

Nagel was a professor at California State University, Long Beach and the founder and executive director of the Museum of Teaching and Learning. Nagel describes how to effectively organize groups so that they are successful. This is a valuable resource because it describes techniques that will help groups become more effective for student learning.

Partnership for 21<sup>st</sup> Century Skills. (2011). Framework for 21<sup>st</sup> Century Learning. Retrieved from [http://www.p21.org/storage/documents/1.\\_\\_p21\\_framework\\_2-pager.pdf](http://www.p21.org/storage/documents/1.__p21_framework_2-pager.pdf)

This article describes what 21<sup>st</sup> century skills are and lists the 21<sup>st</sup> century skills. It also explains the importance of possessing 21<sup>st</sup> century skills for the workplace. The Partnership for 21<sup>st</sup> Century Skills works with leaders of education, businesses, communities, and governments to prepare students for their futures that will involve the use of 21<sup>st</sup> century skills.

Robles, M. M. (2012). Executive Perceptions of the Top 10 Soft Skills Needed in Today's Workplace. *Business Communication Quarterly*, 75(4), 453-465. doi: 10.1177/1080569912460400

Robles explains the difference between hard and soft skills and the importance of each in the business environment. She conducts a study asking business executives what soft skills they find most valuable in the workplace. The article provides a suggestion as to what students need to learn in school to be successful in their future careers. Robles has received a PhD from the University of North Dakota and is currently a professor of Corporate Communication and Technology at Eastern Kentucky University.

Slavin, R.E. (1983). When Does Cooperative Learning Increase Student Achievement?

*Psychological Bulletin*, 94(3), 429-445. Retrieved from [https://www.researchgate.net/profile/Robert\\_Slavin/publication/232480281\\_When\\_does\\_cooperative\\_learning\\_increase\\_student\\_achievement/links/54a1365e0cf257a636024b76.pdf](https://www.researchgate.net/profile/Robert_Slavin/publication/232480281_When_does_cooperative_learning_increase_student_achievement/links/54a1365e0cf257a636024b76.pdf)

Slavin is an affiliate of the Center for Social Organization of Schools and received his PhD from Johns Hopkins University. This article discusses the results of a meta-analysis of classrooms that used cooperative learning as a teaching technique. It also explains that two of the main components that need to be involved in cooperative learning are group rewards and individual accountability. This article is important to consider because it emphasizes two essential components of cooperative learning, rather than other theorists who emphasized five or six elements of cooperative learning.

Slavin, R.E. (2010). What makes groupwork work? *School Leadership Today*, 1(2), 32-35.

Slavin discusses the general topic of cooperative learning and several varieties of cooperative learning, including Student Teams-Achievement Divisions, Teams-Games-Tournament, Team-Assisted Individualization, Jigsaw, Jigsaw II, Co-operative Integrated Reading and Composition, Learning Together, and Group Investigation. Slavin is the

Director of the Center for Research and Reform in Education at Johns Hopkins University. He received his PhD from Johns Hopkins University in Social Relations.

Solanki, P. & Kothari, N. (2014). Group Selection and Learning for a Lab-Based Construction Management Course. *Journal of Education and Training Studies*, 2(2), pp. 217-223.

Retrieved from <https://eric.ed.gov>.

Solanki and Kothari are a part of the Department of Technology at Illinois State University. The researchers compared three different group selection methods for forming cooperative learning groups: performance-based selection by the instructor, individual-selection by students, and random-selection by the instructor. This research is valuable as it compares the effects of various group selection methods to student learning.

Yamarik, S. (2007). Does Cooperative Learning Improve Student Learning Outcomes? *The Journal of Economic Education*, 38(2), 259-277. doi: 10.3200/JECE.28.3.250-277

Yamarik is an associate professor of economics at California State University at Long Beach. The author describes his research of cooperative learning versus traditional lecture style teaching among his students. He speculates that cooperative learning helps student achievement because there is more student-teacher interaction, students may be more likely to approach the teacher as a group, students are given a group to study with, and students' interest in the subject may increase. Thus, this is a valuable resource as it emphasizes that cooperative learning is beneficial for student achievement and cooperative learning encourages a positive classroom environment.