AN INVESTIGATION OF FACTORS THAT INFLUENCE THE IMPLEMENTATION OF COOPERATIVE LEARNING.

by

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Abstract

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An Investigation Of Factors That Influence The Implementation Of Cooperative Learning.

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Schools are under attack for failing to meet the needs of students entering the workforce. Students graduating from high schools need to have skills that will allow them to be successful in the workforce. Corporate America is emphasizing interpersonal skills, negotiations, and teamwork to increase productivity. Many of the skills that workers now need are ones that will allow them to work together effectively in small groups.

Cooperative learning techniques allow students to learn important team building skills that will allow them to be successful in the workforce. Cooperative learning has been proven by many studies, to be an effective teaching method that teachers can use. But, are technology education teachers in CESA 10 and 11 using these techniques? And,

if they are, are they using them properly? If they aren't using them, what are the perceived barriers that inhibit the utilization of cooperative learning methods? And, finally do any of the teachers have any type of training or experience that allows them to teach cooperative learning techniques successfully?

Surveys were sent to technology education teachers of CESA 10 & 11 in West-Central Wisconsin. They were asked selected questions about their perceived levels of utilization of cooperative learning methods. Secondly, they were asked about their perceived level of barriers that inhibit them from using cooperative learning methods and lastly, they were asked to identify their amount of education or experience they have had in cooperative learning techniques.

With these three variables, correlations were tested. The correlation between the level of implementation of cooperative learning techniques and the level of barriers that inhibit the use of cooperative learning turned out to be not statistically significant. From this study, one can't conclude that a relationship exists between the level of implementation and the level of barriers.

The next correlation tested was between the level of barriers that inhibit the utilization of cooperative learning techniques and the amount of cooperative learning education teachers have had. Again, the amount of correlation determined was not statistically significant. Once again, one can't conclude that there is a relationship between perceived barriers of teachers and the level of training teachers have had in learning about cooperative learning techniques in these findings.

The last correlation was between the level of implementation of cooperative learning methods and the amount of education teachers have had in cooperative learning

techniques. The amount of correlation determined was statistically significant at the .01 level. Therefore, from this study, it can be assumed that there is a correlation between the level of implementation of cooperative learning methods and the amount of education teachers have received in learning about cooperative learning techniques.

The findings of this study suggested that the level of implementation of cooperative learning methods increased as the level of teacher training in cooperative level methods increased. The findings also revealed that most technology education teachers are older than forty and have not received any education in cooperative learning and are not apt to start working on a Masters degree program that will allow them to learn about cooperative learning. Therefore, teacher workshops, in-services and professional time to work with other teachers learning about cooperative learning techniques, should be increased in order to expect teachers to utilize more cooperative learning strategies inside the classrooms in CESA 10 and 11.

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Chapter 1

Introduction

The world we live in changes daily. New skills become old skills and people are forced to adapt or fall behind. Corporations in America see the need for a new set of skills in the marketplace. More than ever before, corporate America is emphasizing interpersonal skills, negotiations, and teamwork to increase productivity. Many of the skills that workers now need are ones that will allow them to work together effectively in small groups (Baris-Sanders, 1997).

Schools are under attack for failing to meet the needs of students entering the workforce (Ferguson & Forte, 1995). Unfortunately, the American school system is structured to encourage traditional competition and individualization education rather than cooperation (Baris-Sanders, 1997).

In competitive learning, the student has been taught to do better than his/her peers during classroom exercises. Students are then ranked from top to bottom on how they did on the end result, which may have been a quiz, test or an activity. Feelings of failure, being inferior and isolation often exist with this type of learning.

Students do not have to compete against one another when using individualized instruction. The main theme is to have students work completely alone and at their own pace. The achievement of one student compared to another is irrelevant and often students do not interact about classroom issues.

Using cooperative learning, students work together to achieve one end result. According to Slavin (1987), the definition of cooperative learning is, "…instructional methods in which students of all performance levels work together in small groups toward a group goal. The essential feature of cooperative learning is that the success of one student helps other students to be successful" (p. 2).

Cooperative learning has positive effects on student learning (Baris-Sanders, 1977; Ferguson & Forte,1995). Learning together promotes the use of higher-level critical thinking skills than learning with individualized and competitive instruction. Cooperative learning increases students' motivation and helps create a positive attitude towards a given subject. Other advantages of cooperative learning groups include, increased student self-esteem, shared leadership, responsibility for others and social skill being directly taught. Research has also shown that cooperative learning increases achievement (Baris-Sanders, 1997). Cooperative learning has demonstrated its worth over and over through research in both laboratory and field settings (Ferguson & Forte, 1995).

One of the goals of technology education is to prepare students for the world of work. Not only do students learn with hands-on curriculum, they also learn about group cooperation. Group activities are important because they simulate the world of work. Now, more than ever, businesses and corporations are using teamwork to solve problems and arrive at solutions. Many technical fields present situations where group interaction is necessary and vital for their success. Concepts that are learned in technology education are crucial because

they prepare students for their future of working in groups to solve real world problems. Cooperative learning in the technology education classroom is beneficial for students (Custer, R. L 1995).

According to studies done by Ferguson and Forte (1995), cooperative learning has shown to be a highly effective approach to educating America's youth, yet it is significantly less employed than traditional forms of instruction in the classroom. If cooperative learning has proven to be so successful, why isn't it being used more in the classrooms?

According to Bonwell and Eison (1991), there are many different barriers that inhibit the use of active learning strategies such as cooperative learning. One of the factors that inhibit the use of cooperative learning is time. Teachers find it difficult to prepare and organize the necessary plans it takes to successfully implement cooperative learning methods (Bonwell and Eison 1991). Classroom management can also be a critical factor in determining whether cooperative learning will be used inside the classroom.

In addition many teachers don't know what it takes to achieve cooperative learning. According to Ferguson and Forte (1995), many teachers formed what they considered cooperative groups, but in reality the groups did not work and interact together to solve problems. Teachers have little if any training to prepare them to implement cooperative learning methods. Therefore, they concluded that fewer than 5% of teachers use structured cooperative learning (Ferguson & Forte, 1995). What are the levels of usage of cooperative learning methods inside technology education classrooms? And, how much education

have technology education teachers had in learning about cooperative learning methods?

The studies done by Ferguson and Forte(1995), and Baris/Sanders (1997), proved cooperative learning to be positive on student learning but was being underutilized in the classroom. Both of their studies involved general education classes. A study needs to be done that will focus on the utilization of cooperative learning inside technology education classrooms and laboratories. It also needs to uncover the barriers that technology education teachers encounter while implementing cooperative learning techniques. And finally, it needs to be able to determine the amount of education technology education teachers have in learning about cooperative learning.

Both of the studies also went on to generalize their studies to the entire nation comprising of fifty unique states and areas. A study needs to be done that will focus on West Central Wisconsin. Accurate conclusions about the status of cooperative learning in the surrounding areas is vital for the success of our students.

Statement of the Problem

There is very little research that has been conducted that focuses on the levels of implementation of cooperative learning, the levels of barriers that inhibit the use of cooperative learning and the level of education teachers have had in learning about cooperative learning techniques. A study needs to be done to compare all three variables and to determine their relationships. A study needs to be done that will focus on the

status of cooperative learning in West Central Wisconsin. It is vital for the success of students in the region.

The Purpose of the Study

The purpose of this study is to determine the level of implementation of strategies commonly used to define cooperative learning by technology education teachers in West Central Wisconsin. In addition, the obstacles that teachers from this region perceive that prevent them from implementing cooperative learning and the level of training teachers receive will be determined. Once this information is collected, it will be determined if a relationship exists amongst these three variables, namely level of implementation, obstacles and level of training.

Research Hypotheses

The hypotheses of this study stated in null form are:

1. There is no statistically significant correlation between the amount of training in cooperative learning techniques and the level of usage of cooperative learning techniques.
2. There is no statistically significant correlation between the level of obstacles teachers encounter while using cooperative learning and the amount of training in cooperative learning techniques.
3. There is no statistically significant correlation between the level of usage of cooperative learning and the level of obstacles teachers encounter while implementing cooperative learning techniques.

Chapter 2

Review of Literature

Introduction

The review of literature will cover six essential topics. The first topic will contrast cooperative learning with two "traditional forms" of learning called competitive and individualistic learning. The Group Theory segment will explain the basic understanding about groups and group development. Then, the five basic elements of cooperative learning will be presented. The fourth topic will provide information about different methods used in cooperative learning. Then, the effectiveness of cooperative learning and the research that supports it will be discussed. Finally, the barriers that inhibit teachers from using cooperative learning in their classroom will be explained.

Competitive, Individualistic & Cooperative Learning

Research indicates that although cooperative learning is a highly effective approach to educating America's youth, it is employed significantly less than competitive and individualistic forms of education (Ferguson, 1995). Competitive and individualistic learning are commonly used methods in today's schools.

Competitive learning is one form of traditional education. Its use can be traced back to the Greeks. The creed of competition as a virtue is entwined deeply into our social fabric. Our children learn to be competitive not only at home and at sporting events but also in schools (Johnson & Johnson, 1991).

Competing with and defeating an opponent is the basis of competitive learning. There is always a winner and a loser to any event. In a competitive situation, individuals work against each other to achieve a goal that only one or a few can attain. Individuals

are expected to work faster and more precisely than their peers (Johnson & Johnson, 1991).

For competition to exist, some form of scarcity must be evident. Two people may compete for a loaf of bread. Ultimately, one will eat, the other gets nothing if it is a competition. In an attempt to motivate students, teachers can artificially limit the number of A's. There is no set number of A's that should be given out in each class, but under competitive learning, a normal curve is used.

Individualized learning is another traditional form of education. It is based on the fact that humans do not always interact with others. Individuals work alone to accomplish goals with little interaction with others.

Many times goals are assigned to individuals along with a set of standards. The individual is rewarded on the basis of how his/her efforts compare to preset criteria. Other times the individual sets his/her own goals. An example of this is weight control. Many times individuals set desired weight and time deadlines to meet them. Whether an individual accomplishes his/her goal has no effect on whether other students achieve their goals. For this reason, achievement is fully personal and not related to others.

Teachers can structure lessons that are individualistic so students work by themselves. In individually structured classes, students are assigned a task that will be graded according to standards set by the teacher or the curriculum. They would be told to work by themselves, without disturbing others and to seek help from the teacher (Johnson & Johnson, 1991).

Cooperative learning is working together to accomplish some shared goals. It is the use of small groups that force students to maximize each other's productivity and

achievement. An individual seeks an outcome beneficial to themselves and, more importantly, to the group members. "In cooperative situations, individuals perceive that they can reach their goals only if the other group members also do so" (Deutsch, 1962). Their goal attainment is positively correlated (Johnson & Johnson, 1991).

Teachers can structure lessons cooperatively so students work together to accomplish a task. Students can be assigned to small groups to learn the material, making sure others learn as well. It is always a good idea to individually check performances. In groups, students discuss information with each other, help one another understand and encourage others to work harder.

Basic Group Theory

Basic group theory is understood by defining what a group consists of and then how a group develops and finally, what makes group dynamics. Based on functional theory, there is a way to sort out the differences among groups, teams and crews. Using definitions, characteristics and an overall scheme helped to separate groups from teams and crews (Hare, 1992).

After reviewing eighty different definitions of a group, theorist M. Shaw (1981) concluded: “A group is defined as two or more persons who are interacting with one another in such a manner that each person influences and is influenced by each other person” (p. 16). In order to tell how strong a group is, characteristics of the individual interactions are listed as follows. According to Shaw (1981), the larger number of correlating attributes, the greater their strength and the closer the set of individuals comes to being a full fledged group:

1. They engage in frequent interaction.

2. They define themselves as a member of a group.
3. They are defined by others as belonging to the group.
4. They participate in a system of interlocking roles.
5. They find the group rewarding.
6. They pursue promotively interdependent goals.
7. They tend to act in a unitary manner toward the environment. (p. 17)

According to literature on teams, theorist W. Dyer (1981) defines a team as "a collection of people who must collaborate, to some degree, to achieve common goals" (p. 16). He also suggests that various teams can be placed along a continuum according to the amount of collaboration between team members and role differentiation as being important. One example he uses is the golf team, which is composed of a set of individual performers who are working for the benefit of individuals. On the other hand, baseball teams have members that have separate roles but are concentrating on the success of the team.

For some authors, the definition of a team is evident in their description of an "effective" team. In Hare's (1992) book, Groups, Teams and Social Interaction: Theories and Applications, Patten is regarded as one of the early researchers on team building within an organization. He suggested four preconditions before a group of managers could develop into an effective team:

1. The team must have a natural reason for working together.
2. The team must be mutually dependent to fulfill mutual objectives.

3. Team members must be committed to the idea that working together as a group leads to more effective decisions.
4. The team must be acceptable as a functioning unit within a larger organization. (p. 23)

As seen from the various definitions and characteristics of groups and teams, groups are not too different from teams in their basic components. Many times the term "team" is used as a synonym for "group". However, all teams are groups, but not all groups might be designed as teams. This is because of the member interaction and the overall objectives of either the group or the teams (Hare, 1992).

Also, a crew is defined as a body or squad of people engaged upon a particular piece of work or under a foreman or overseer. The term "crew" typically refers to a group of persons managing some form of technology. Their function is bound to a particular type of equipment or technology. Generally, crew is seen to be a group of people who are bound to a particular type of equipment or technology such as a boat, spaceship or airplane (Hare, 1992).

The term "group" is the most general, and it often is used to refer to a set of individuals who have some characteristic that are similar and have a general goal. The term "team" is more specific since a joint action is implied, such as sports teams being an example. The term "crew" typically refers to individuals managing some sort of transportation technology such as a boat or spaceship (Hare, 1992).

According to Hare (1992), a method to differentiating among groups, teams, and crews is using the Integration and Role Differentiation classification. Here, two variables are used which are role differentiation and integration. Role differentiation refers to a

specific job or event one person has to complete. Role integration refers to the amount of overlap or similar action group members need to do in order to accomplish their objective. Teams could be either classified as low or high according to their characteristics. From this comparison, golf teams are low on both integration and role differentiation. Synchronized swimming teams are high on integration but low on differentiation.

For the purposes of this study, the term "group" will be used. A group is defined as two or more persons who are interacting with one another in such a manner that each person influences and is influenced by the other person(s) and they have a common goal to which they will be working to find a solution or to come to a consensus.

Once groups have been formed, the individual is now one with the other members. The group will need to learn and develop together to become successful. Each group goes through different stages before becoming successful.

Research in the area of group development is quite extensive. Many researchers have done studies that conclude similar findings with small variances. As Hartely (1997) reports, "The most widely quoted model of group development is the one first suggested by Tuckman in 1965" (p. 54). Hartley (1997) cites a study by Tuckman, who surveyed all the studies of group development that he could find, and concluded that there was a common pattern. According to Tuckman, groups go through four stages of development which are forming, storming, norming and performing (Hartley, 1997).

The first stage is called the forming stage. Groups have a sense of uncertainty and confusion. It is a time when members are orientating to the task. Members try to identify the task and how they should solve it. They decide what information they will need and

also try to set ground rules at this time (Hartley, 1997). The process members go through is called "testing and dependence" according to Tuckman (1965, p.56). Members determine which personal behaviors are acceptable to the group. At this point, members are dependent on the leader of the group and the reactions of the other group members (Hartley, 1997).

The second stage is called the storming stage. Often a period of conflict about the goal creates hostility towards other members. Emotions usually run high toward the task at hand. A form of resistance also emerges toward the goal, and the steps they need to finish the task. The process members go through is an intra-group conflict. An outstanding feature of this stage is the lack of cooperativeness. Often members are both hostile to the leader and to the other members of the group (Hartley, 1997).

The third stage is called the norming stage. The group starts to pull together and an agreement about the task is near or at least being discussed. An open and free flowing discussion about the problem and its possibilities takes place here. Members go through a process called the development of group cohesion. Group members will start to accept each other and what is considered normal and accepting to the group. A strong sense of harmony will be conveyed and conflict and will be avoided by the members (Hartley, 1997).

The fourth stage is called the performing stage. An emergence of solutions is clear. The stage is characterized by thoughtful and constructive attempts to a successful task completion. Members are often observed helping other members to bring to an end or finish-up a problem (Hartley, 1997).

According to Hartley (1997), Tuckman returned to this topic in 1977, when he decided that he could identify one more stage, the adjourning stage. He conclude this when groups were to part or split-up, they make efforts to complete the task and give farewells to other members (Hartley, 1997).

Another study by Bales and Strodbeck in Hartley's (1997) book, Group Communication, concluded that groups typically switched between concentrating on the task and concentrating on their social and emotional needs-the maintenance of the group. They also developed this into an equilibrium theory which proposes that groups need to find a balance between the two in order to work effectively over time. The search for equilibrium will lead to the group flipping backwards and forwards from one phase to another.

Understanding group theory and what makes an effective group is important. Not only do groups go through developmental stages, but they all have a common goal that places each member into a role. Roles in groups are important to the groups' success (Hartley, 1997).

As cited by Beane and Sheats in Hare's (1992) book, Groups, Teams and Social Interaction: Theories and Applications, roles in small groups have various characteristics. Their explanations divided group roles into three categories: the group task, group maintenance and the individual.

The first distinction was group task roles. These members initiated ideas and requested information from other members. The second set is called group maintenance roles. Supporting or encouraging others was a main characteristic of this role. This role required members to resolve conflicts within the group. The last category was the

individual roles. Here, members were seen as people who blocked the path to success or were the recognition-seekers (1997).

Beane and Sheats (1992) description of group roles lacks much detail. The distinctions among roles seems to confuse different concepts and group functions. For these reasons, as cited by Belbin, in Hartley's (1997) book, Group Communication, Belbin offers further explanation on team roles.

Over a period of ten years, Meredith Belbin (1997) observed several hundred teams of managers engaged in management exercises using an observation scheme as a basis. Questionaires and personality tests were administered, collected and interpreted. The result was a comprehensive model of team-building based on the following observations:

*Behaviors of team members are organized in a limited number of teams roles, which are independent of the technical expertise or formal status.

*Managers will always use one of the team roles.

*Personality characteristics are linked to team roles.

*The teams' success is dependent on the combination of team roles adopted by the members. (p. 67)

Belbin (1997) also went on to identify eight team roles and their contribution to the group.

Role	Main contribution to the group
1.) Co-ordinator	Organizes and coordinates Keeps team focused on main objectives Keeps other members involved
2.) Team leader	Initiates and leads from the front Challenges complacency or ineffectiveness

	Pushes and drives towards the goal
3.) Innovator	Provides new and creative ideas
4.) Monitor-evaluator	Provides dispassionate criticism
5.) Team worker	Promotes team spirit
6.) Completor	Checks things to be sure they have been completed Monitors progress against deadlines
7.) Implementor	Mentors practicality and hard working skills Focuses on the tedious tasks
8.) Resource Investigator	Makes contacts outside the group (p. 73)

The most evident implication from Belbins' (1997) work is that all roles are valuable. Many times more than one person took on different roles. On the other hand, sometimes one person took on different roles. These group roles can be used with any size groups.

One point never discussed was, how a leader was selected. As cited by Hartley (1997), Belbin said "…it depends on the situation, just as there are horses for courses, so there are leaders for teams" (p. 123). In other words, when team members decide what the situation requires to be solved, the job roles will be more evident and members will adjust to the group's needs.

Cooperative learning has its roots in group theory. Understanding how groups develop and interact with other group members is essential when using cooperative learning techniques. The following section focuses on what is necessary to create positive learning groups.

Basic Elements of Cooperative Learning

In order for students to become successful while working in cooperative groups, the group must have certain characteristics. Johnson, Johnson and Smith (1991), find that cooperative learning has five basic elements that need to be present before it can be considered effective.

1. Positive Interdependence**:** Students realize that they need each other in order to complete the assignment.

2. Face-To-Face Interaction: Students promote each other's learning by helping, sharing, encouraging, explaining, teaching and discussing.

3. Individual Accountability/Personal Responsibility: Each student's performance is assessed and the results given to the group and the individual.

4. Interpersonal Skills: These skills include leadership, decision-making, trust-building, communication and conflict-management.

5. Group Processing**:** Groups need time to discuss how the group is doing. Teachers can assign each group member to list three actions that help the group and one action that could be added to make the group better. (p. 1:18)

Positive Interdependence

Positive interdependence means students must believe that they either "sink or swim together". Students have two responsibilities: they need to first learn the assigned material and then ensure that all members of their group learned the material. This has often been referred to technically as positive interdependence (Johnson, Johnson and Smith, 1991).

Positive interdependence is present when students believe they are linked with group members in a way that they cannot succeed unless the other members succeed. It is also present when students must coordinate and work together to finish a task. Positive

interdependence promotes a circumstance in which students can see that their individual work benefits group members and their groupmates' work benefits them. It also highlights members sharing their resources, providing mutual support and celebrating joint success (Johnson, Johnson and Smith, 1991).

Teachers can structure positive interdependence within a learning group by using different group formats. There are several ways to accomplish positive interdependence. The following examples are some of the more common ways positive interdependence is being practiced.

The first is positive goal interdependence. Students need to perceive that they can achieve their goals if and only if all the members of their group also attain their goals. Students need to care about other group members and the assigned goal. The group motto is "learn the assigned material and make sure that all members of your group learn the assigned material," claim Johnson, Johnson and Smith (1991, p. 3: 5).

The second format is called positive reward/celebration interdependence. Here, each group member receives the same reward when the group achieves its goals. Sometimes when all group members receive a quiz score above ninety percent, bonus points are given. Instructors also give students a group production grade, individual grades, and bonus points if all members achieve the group goal. Many times a celebration of the groups' efforts are given (Johnson, Johnson and Smith, 1991).

Positive resource interdependence is the third format for providing a positive interdependence. Each group member only has a portion of the resources, materials and knowledge required for the job to be completed. In order to achieve the group's goals, the members need to combine and use each others' materials or knowledge before they

become successful. Often giving students limited resources forces them to collaborate to finish their goals (Johnson, Johnson and Smith, 1991).

The fourth format of positive interdependence used is called positive role interdependence. Each member is assigned a role in the group, such as a reader, checker or a recorder. Each role is vital in order for the group to become successful. This system can be structured so that a member of each group "checks" other member's understanding of material. This can be a time saver for teachers (Johnson, Johnson and Smith, 1991).

Face-To-Face Interaction

Face-to-face promotive interaction is another basic element in structuring an effective cooperative learning group. Promotive interaction refers to group members encouraging and assisting each other to achieve, to complete a task, to be productive and to obtain a goal. Face-to-face promotive interaction influences efforts to achieve, to pursue caring relationships, to make psychological adjustments and to fit in socially. It is characterized by individuals helping each other with tasks and exchanging resources. This may also come in the form of verbal feedback that students give to improve their team's productivity. Promotive interaction is vital before a team can become successful (Johnson, Johnson and Smith, 1991).

Individual Accountability/Personal Responsibility

Individual accountability/personal responsibility is the third basic element needed when producing an effective cooperative learning situation. This element is present when the performance of each individual student is evaluated. The results are given back to the individual and the group, and students are held responsible by groupmates. This is

important because the group needs to know who needs more assistance, support and guidance. There cannot be "hitch-hike" members who rely on the work of others. When individual students' responsibilities are blurred, members sometimes seek a free ride. Another name for this is called social loafing (Johnson, Johnson and Smith, 1991).

Individual accountability is the key to ensuring all members are truly benefiting from cooperative learning. Students should be provided feedback so they know how they are doing and how their partners are doing. Johnson, Johnson and Smith (1991) suggest common ways to structure individual accountability include the following elements:

1. Structuring a group with a smaller number of members.
2. Giving individual tests or quizzes.
3. Orally examining students randomly to keep students accountable.
4. Observing and recording the contributions of each member.
5. Assigning a group checker to make sure students obtain tasks.
6. Having students teach what they have learned. (p. 3:19)

Interpersonal Skills

Interpersonal skills are the fourth basic element required to make an effective cooperative group. Placing students into a group and expecting them to cooperate does not guarantee an effective group. We are not born knowing how to effectively interact with others. Students must be taught the social skills required to have a high quality and productive group (Johnson, Johnson and Smith, 1991).

According to Johnson, Johnson and Smith (1991), "the more socially skillful students are, and the more attention instructors pay to teaching and rewarding the use of social skills, the higher the achievement that can be expected" (p. 3:9). Other studies

done by Lew and Mesch (1992) have also concluded that higher achievement results from students being socially skilled to work in a cooperative group.

Group Processing

The fifth and last basic element required to make an effective cooperative group is called group processing. Group work is influenced by whether or not group members reflect on how well they worked together. Group processing may be defined as reflecting on the group's work and identifying what was helpful and what was not and possible modifications that can be made. The main purpose is to improve the effectiveness of the members in contributing to the collaborative efforts to achieve the group's goal (Johnson, Johnson and Smith, 1991).

Studies done by Stuart Yager and David and Roger Johnson (1991) have concluded many times over that group processing improves scores on post-tests and on students retention level. Group processing can be done within the group or by the teacher; it produces higher achievement than without it (Johnson, Johnson and Smith, 1991).

There are two levels of group processing, small group and whole class. In small group processing, instructors allocate some time at the end of each class for students to express how group members worked together. The group members need to discuss within the group what was helpful and what was not. They also need to come up with modifications or changes in order to increase productivity within their own group (Johnson, Johnson and Smith, 1991).

Whole class processing is periodically used by the instructor, observing a group at work. They analyze the problems the group is having and give them feedback on how to

improve productivity. The instructor systematically moves from group to group and observes the work. At the end of the class, the instructor can then share with the class the results of his or her observations. Sometimes, if a peer observer has been utilized, the results of his or her observation may be collectively added to the instructors' observations.

Within small and whole group processing there is an important aspect called celebrations. It is here where a feeling of success, appreciation and respect is built that fuels learning, enthusiasm and a sense of self-confidence in working in groups.

According to Johnson, Johnson and Smith (1991), "Using the five basic elements of cooperation skillfully increases an instructors' power to increase student achievement, build a more caring and supportive learning community, and enhance students' psychological adjustment and social competencies" (p. 3: 13). If instructors want learning groups to be more successful, they only need to use the five basic elements refined to fit into their classrooms (Johnson, Johnson and Smith, 1991).

Methods of Cooperative Learning

Different types of approaches to cooperative learning have been developed over the years. According to Kagan (1990), three approaches to cooperative learning include learning together, structures and curriculum packages. These three approaches have unique characteristics, yet are interrelated enough to be considered cooperative learning.

According to Kagan (1990), learning together is a framework for applying cooperative learning to any grade level in any subject. The main thrust is the basic principles of cooperative learning and its elements such as positive interdependence, face-to-face interaction, individual accountability and group processing.

The structural approach to cooperative learning is based on the definition and use of various, distinct ways of organizing the interaction of students in a classroom, called structures. This approach allows systematic design of cooperative learning lessons and has predictable outcomes in academic, cognitive and social domains of learning (Kagan, 1990).

The last approach according to Kagan (1990), is called curriculum specific packages. Curriculum specific packages are content bound. "Packages are one or more structures combined with curruculum materials specially designed for cooperative learning," (Kagan, 1990, p. 54). The curriculum packages represent a mixed set of task and reward structures based on students learning content.

For the sake of this study, seven methods of cooperative learning were reviewed that encompassed these three different approaches. The seven cooperative learning methods chosen include Student Teams-Achievement Division (STAD), Teams Games and Tournaments (TGT), the original Jigsaw (called Jigsaw I), Jigsaw II, Group Investigation, Co-op Co-op and Think-Pair-Share.

Student Teams-Achievement Division

Using the Student Teams-Achievement Division created by Slavin (1983), five components comprise the method. Initially, the class is presented with material from the teacher or in an audiovisual presentation. Teams of four to five students with a heterogeneous nature with regard to sex, the ethnic background and their ability level are created from the class. Teams work together in a peer-tutoring format to learn the material. Often team members either quiz each other or use worksheets to guide and discuss information to be mastered (Slavin, 1983).

Grades are earned from individual quizzes. According to Slavin (1983), "… quizzes assess individual achievement on the material presented in the class and practiced in the teams" (p.26). A scoring system also allows students to earn points for their teams based on improvement over a running average of past scores. A "base score" for each student is periodically readjusted and students earn extra points based on how they improved from the base score. To applaud high, individual, weekly performance and /or high cumulative scores standing, teachers use newsletters, bulletin boards and other forms of social recognition and rewards. Often students with good improvement are also recognized.

Teams-Games-Tournaments

The Teams-Games-Tournaments (TGT) is another method of cooperative learning. It is identical to STAD except quizzes are replaced with academic game tournaments and individual improvement scores are replaced with a bumping system (Slavin, 1983).

After students have been assigned to heterogeneous groups and have learned the material, they are ready for tournament play. Homogenous groups, with regard to ability level, consisting of three students are then formed. The groups of three take turns answering content-relevant questions. Students can earn extra points by correctly challenging the answer of another student. The highest scorer from each of the groups earns six points for his or her team, the middle scorer earns four points and the lowest scorer earns two.

Initially, the teacher assigns student to tournament tables based on ability level. Following each round, the highest point scorer moves to a table of high point scorers and

the lowest scorers move to a table of low scorers. This way, an equal opportunity is given to all students. Scores are kept and tallied at the end, and grades are based on improvements and scores.

Jigsaw I

Another method of cooperative learning is called the Jigsaw I. Jigsaw I was developed to create a situation of extreme interdependence. Each student is given only part of the academic unit but graded on the mastery of the whole unit. In a way, each member is given a piece of the puzzle and forced to learn the other pieces from another student. The curriculum used needs to be specially designed for Jigsaw I. Each member of the team needs information that is comprehensible without reference to other student pieces.

Communication is essential to the success of the Jigsaw I method of cooperative learning. Before beginning units, special team-building and communication-training activities are included. This involves role-playing, brainstorming and other specifically designed group activities. The importance of a group leader is vital. Group leaders are selected by the teacher, and they receive special training. "The group leader is expected to help organize the group, to keep the group on talk, to serve as the grup-teacher liason, to model productive social and academic behaviors, and to help resolve conflicts" (Kagan, 1985, p. 71).

Teams range in size from three to seven, but five and six member teams are recommended. The teams are assigned by the teacher with regard to students' ability levels, race, gender, and personality factors such as motivation.

Students are assigned a piece of information which they are to digest and understand. To ensure comprehension, expert groups are formed that consist of students from the same piece of information. The expert groups meet and exchange information to master their piece. Then expert groups are separated so students go back to their heterogeneous groups and teach the rest of the students in their groups. To grade and assess students, individual test or quizzes covering all of the material of the learning units are included. There is no group reward (Kagan, 1985).

Jigsaw II

The Jigsaw II was created from the original Jigsaw method so that facilitators could use existing content information and take advantage of some features of STAD. Students are assigned to heterogeneous groups as in STAD, and then assigned to expert groups within the teams. They are then instructed to read the entire learning unit with an emphasis on their piece of the puzzle. Next, they meet in expert groups to master their topics and further understand the similar content. They then report to their original teams and teach their group members. At the end they take an individual quiz, which contributes to a team score, and finally, an individual and team recognition award is given (Kagan, 1985).

Jigsaw II varies from Jigsaw I because of the following differences. All students have access to all learning material, thus causing less interdependence. The use of existing curriculum material is more practical and economical than Jigsaw I. Jigsaw II is also different from Jigsaw I because of the uses of base scores, improvement scores, team scores and individual and team recognition techniques found in STAD. Jigsaw II also uses four person teams compared to Jigsaw I, which uses five or six member teams. The

teams are formed similar to STAD and TGT, which does not involve much teacher intuition and personality factors of students (Kagan, 1985).

Lastly, there is no team building and differentiating of student roles in Jigsaw II. No attempt is made to place students in a leadership role, and thus specialized leadership training is not needed.Group Investigation.

The fifth method of cooperative learning was developed by Sharan and Hertz-Lazarowitz (1980) and is called Group Investigation. Group investigation was designed to provide student with broad and diverse learning experiences. This method is quite different from the STAD, TGT and the Jigsaw techniques because it is not so content and skill centered (Kagan, 1985).

The group investigation method progresses through six consecutive stages. Stage I identifies a topic and organizes pupils into research groups. By using various techniques to identify student interests and goals, students are placed into three to six member groups. The groups should be as diverse as possible. Ideally, groups should be composed of members from each gender, with varying learning abilities and different ethnicity.

Stage II involves planning the learning task. The members of the group identity the subtopics to be researched. The topics should pose problems that can be dealt with in a variety of ways; they are very complex, unlike the STAD and TGT. According to Kagan (1985), "The groups ultimately decide what is to be studied and how it is to be studied, and they determine the goal of the study," (p.72).

Stage III is carrying out the investigation or the research. Students gather information, analyze, evaluate and reach conclusions. The use of other sources of information, feedback from the teacher and communication with collaborators is stressed.

Stage IV is preparing a final report. The group must engage in learning experiences that culminate in a report, an event, or a summary. Organizing, abstracting and synthesizing are highly recommended. At this point a steering committee is formed that is made up of one representative from each group. This group meets and is focused on coordinating time schedules, reviewing requests for information and making sure ideas and projects are realistic and interesting. Also, at this point content and the method of presentation is agreed on.

Stage V is presenting the final report. The final presentation may take on different forms, which includes an exhibition, skit, debate or report. The presentation should include sharing of information and is often a moving experience.

Stage VI is when the evaluation process occurs. Different forms of evaluation are possible. Teachers and student can collaborate on evaluations, including the configuring of the exam. Affective experiences should also be evaluated including motivation and involvement. The steering committee should be involved in this process.

Co-op Co-op

Another method of cooperative learning was developed by Kagan (1985) and is called the Co-op Co-op. As Kagan (1985) reports, " the essence of Co-op Co-op is structuring the classroom so that students work in cooperative teams toward a goal that will help other students in the class" (p. 73). Co-op Co-op is also a multifaceted learning technique that allows students to control what and how to learn, just like group-

investigation. The differences are it is a simpler classroom structure, with no steering committee and little interrelation among groups.

There are ten consecutive steps with the Co-op Co-op method. It starts out with a student centered class discussion. Background information, experiences and ideas are used to uncover and stimulate student curiosity. Next, the selection of student learning teams is achieved. Heterogeneous teams with regard to ability level, gender and ethnic background is followed closely.

The third step is team building. Similarly to the Jigsaw I method, team building communication activities and experiences are incorporated to increase cooperation within teams. Next, the team topic is selected. Students divide learning units into topics and each team is responsible for one aspect of the learning unit. This way, each team will help in moving the class toward mastery of the entire unit.

The fifth step is selecting the mini-topic. As in Jigsaw, each student becomes an expert in one aspect of the team goal. The students divide the topic and then mini-topics are selected by the students. The next step is a continuation of the fifth step because here is where students individually gather and organize materials on their mini-topics.

The seventh step is the mini-topic presentations. Each student presents to the group what he or she has learned on his/her topic. At this point, a group is advised to discuss and determine how each individual's mini-topic is related to the main topic.

The eighth step gives student an opportunity to prepare the team presentation. Teams prepare a presentation for the whole class on what they have comprehended about their topic. This leads into step nine which is team presentations. Presentations are made

to the whole class. Non-lecture presentations such as demonstrations, role playing and audio-visual presentations are recommended.

The tenth and final step is evaluation. Evaluation is made of the individuals to the team, usually done by team members. Another evaluation is on the team presentation to the whole class, which is done by the students and finally, of each individual paper or project is evaluated by each student in their mini-topic, usually done by the teacher (Kagan, 1985).

Think-Pair-Share

The final cooperative group method is called think-pair-share. According to Lyman in Kagan's (1990) book, Cooperative Learning: Resources for Teachers, think-pair-share was developed to encourage student participation in the classroom. Students are taught to use a different response cycle in answering questions. The components of think-pair-share are that the student listens while the teacher poses a question. Students are given time to think of a response. Then, students are told to pair with a neighboring student and discuss their responses. Finally, the students are invited to share their responses with the whole group (Kagan, 1990).

In this section of the review of literature the different cooperative learning methods were discussed. Each of the methods has it's own characteristics and circumstance that it should be applied. When used properly, all of these methods will increase student achievement.

Effectiveness of Cooperative Learning

Cooperative learning has many positive affects on students' achievements. These positive affects have been researched for the past ninety years in over five hundred

studies. In this segment of the review of the literature, the effectiveness of cooperative learning will be explained in detail.

According to Johnson, Johnson and Slavin (1977), "positive effects on achievement have been anticipated because in a cooperative group, students are likely to encourage and help one another" (p. 9). Most people will agree that working cooperatively makes school social and exciting. But does that necessarily mean that it will increase student achievement?

Slavin (1983) identified forty-six field experiments in elementary and secondary schools that researched the outcomes of cooperative learning on student learning. Control groups were used as a basis to compare the effects of cooperative learning techniques. The results stated that a favorable effect on student achievement was evident in twenty-nine of the studies and no difference in fifteen. Two studies reported a significant difference favoring the control group.

The most successful format for increasing student achievement was when the group scores were composed of the sum of individual achievements. Of the twenty seven studies, where all group members studied the same information and group rewards were based on the individual achievements group total, twenty four or eighty-nine percent showed a significant positive effect on student achievements in comparison to the control group. Particular cooperative learning methods such as the Jigsaw II, and the Group Investigation were considered very successful in student achievement (Slavin, Sharon, Kagan, Hertz-Larzarowitz, Webb and Schmuch, 1985).

With the results of these studies, Slavin concludes that individual accountability and group rewards are vital in order to have positive achievement effects. If learning of

every group member is not important to the success of the group, or group members are not important to the success of the group, or group members not rewarded, the achievement level will not be any greater than traditional forms (Slavin, et al, 1985).

The positive effects appear in elementary and secondary schools in suburban, urban and rural schools. Also the positive achievement is evident across curriculum such as science, reading and mathematics. Most of the studies show that high, average and low achievers gain proportionally from a cooperative learning experience. Few studies have shown greater gains for low achievers and other studies claim the greatest gain is with high achievers (Slavin, et al, 1985).

In addition to Slavin's (1985) work, there were also one hundred and twenty two other studies conducted between 1924 and 1981. These studies compared cooperative learning to competitive and individualistic learning experiences. The results indicate that cooperative learning experiences promote higher achievement than individualistic and competitive learning experiences. Once again, the results are true for all subject areas, types of students and different schools. As documented by the Johnsons (1988), the achievement was based on problem-solving, categorization, retention, motor performance and predicting.

Knowing cooperative learning situations promote higher achievement than competitive and individualistic learning situations is not enough. A study conducted by the Johnsons and other colleagues aimed at identifying the factors that contribute to the effectiveness of cooperative learning.

1. The type of task does not seem to matter when comparing the effectiveness of cooperative learning versus competitive and

individualistic learning. Generally speaking, on most tasks and especially the more important learning problems, including concept understanding, verbal problem-solving, spatial problem-solving and retention, cooperative learning experiences are more effective in promoting achievement.

2. In cooperative learning groups, the discussion promotes the use of higher level cognitive strategies compared to competitive and individualistic learning situations.
3. While students are participating in cooperative groups, it is impossible to not have conflicts. The conflicts usually are among ideas, opinions, conclusions and theories. If the conflicts are managed carefully and skillfully, such disagreements increase motivation to achieve, to promote higher achievement attainment, to support memorization of repeated information and a greater depth of understanding.
4. Discussion within groups leads to information exchange. It promotes more oral repetition of information, stating of new details, understanding, integrating and providing reasons for or against their beliefs. The repetitive oral information exchange is important for the storage of information into the memory. It has been proven to increase long-term retention of information, and it generally promotes achievement.

5. The atmosphere of which group members become a part turns into considerable peer regulation, feedback, support and encouragement of learning. With the individualistic and competitive learning styles, communication between students about classroom information is limited.
6. Students are put together in groups of heterogeneity. All of them bring different levels of achievement, ethnicity, and backgrounds into the group. With these differences, the learning experience is highlighted. Cooperative groups seem to be nourished by the differences in group members as students accommodate themselves to each other's perspectives.
7. The responsibility and support to each other in the group tends to increase as time passes within groups. Students begin to like one another and encourage one another to do it better for the team effort. Most people call this motivation, which is not hardly evident when using competitive and individualistic learning. (p. 5:19)

Barriers to implementing Cooperative Learning In the Classroom

Most people do not like to change. The word "change" raises eyebrows and even makes people nervous and excitable. In order for teachers to implement cooperative learning into their lesson plans, they must change or modify existing teaching instruction.

In this section, the literature will cover common barriers that discourage teachers from trying new active teaching models such as cooperative learning in their classrooms.

According to Bonwell and Eison (1991), there are six common barriers that inhibit teachers to change. The first barrier is the feedback circle in the classroom tends to be stable. Students tend to come into the classroom with certain learning expectations. One study by Perry (1968), suggested that students want structured lectures in which teachers describe clearly what they need to know. Many of these students expected the instructors to maintain control over the class and to dictate the direction that the class would take. Many of these students also believed that a student's job is to take good notes and memorize what is being taught.

Here, teachers and students become comfortable with the type of learning taking place. Neither of the parties feels a need to change. Teachers who employ cooperative learning in their classrooms are unlikely to please all of their students, all of the time. But then again, teachers who just lecture do not please all of their students, all of the time.

The second barrier to changing is that teachers feel discomfort and anxiety. According to Bonwell and Eison (1991), having some degree of discomfort and anxiety in response to a person's attempt to trying something new is more than likely a universal characteristic. Inside the classroom, teachers trying something new is often awkward and out of the norm. According to studies done by Evans and Leppmann back in 1967, teachers at a university tended to be conservative, and apprehensive about trying new techniques within their classroom. Though the data is relatively old, no new data has been presented that proves anything different according to Bonwell and Eison.

The ease of lecturing and controlling a room full of students is the third barrier to changing. According to Bonwell and Eison (1991), the teacher enjoys doing all the work and dictating the topics being discussed. Students sit, listen, take notes and try to understand the information being presented. In a freshman psychology class, students took notes while the teacher presented the information. The students seemed to be lifeless, flipping through paperback books and staring into space. Until the teacher said "this concept might be on the exam," did students look up and pay special attention to their notes. The teacher didn't mind because the class was behaved and the content was thoroughly covered during the lecture.

The fourth barrier to changing is the lack of incentives for teachers to change. According to Bonwell and Eison (1991), a belief that hinders teachers is that "we are all good teachers". In a survey of 24 campuses, 20 to 30 percent of teachers rated themselves as being "superior" and 58 to 72 percent of all teachers rated themselves as "above average". Adding the lower of the two percentages sums up to be 78 percent. In other words, nearly all teachers believe they are "above average". Bonwell and Eison (1991), go on to say "when one's self-perception includes the image of being an above average teacher, little reason exists to try new approaches to teaching" (p. 73).

By not providing clear and visible rewards for innovative teaching, schools naturally endorse the status quo of classroom instruction. Teachers do not challenge themselves and try new concepts in classroom instruction. The personal cost of trying something new is often high. Before trying something new, one must believe it will bear fruit and be worth one's time and effort. Given that most teachers see themselves as "above average," few financial incentives to change are evident.

The fifth barrier to changing is the professional setting in which faculty work tends to be stable. Teachers work side by side, share the same classroom and even sit in the back of the room grading papers, while another teaches. At the same time passively watching and observing what the other is doing. They form beliefs on how classroom instruction should occur. They develop a reassuring bond between each other that makes them feel stable about the environment in which they teach.

The final and greatest barrier to changing is called risk. To be able to understand the true adoption of something new, one must understand the phenomenon within the classroom. Teachers fear not only how students will react to different classroom instruction, but also how other teachers will view their teaching.

Teachers worry about how students will react to having an active or cooperative classroom. Studies done by Bonwell and Eison (1991), reported often students became passive and bored. Students did not want to participate and often did not seem to learn what the instructor had wanted them to learn. Ironic as it may seem, based on the literature on cooperative learning, students learn as much or more when alternatives to traditional lectures are used.

"Developing instructional strategies to help students learn to think creatively and critically has become recognized as one of the most pressing educational challenges facing teachers." according to Bonwell and Eison (1991, p.77). Teachers are under the microscope to perform and become successful. Teachers also run the risk of losing control of the classroom and having other teachers look down on them for their teaching miscues. When asking students to be more active, the risk of having students ask a

difficult question that the teacher can't answer would be embarrassing causing a lack of respect to the teacher.

Losing class control, being stable with colleagues and within the classroom, lack of incentives, enjoying listening to oneself and discomfort are the six barriers to changing. With these in mind, readers should have a better idea of why people and more often teachers, tend not to change.

Bonwell and Eison (1991) then go on to include other barriers that teachers need to overcome in order for them to use active or cooperative learning in the classroom. These barriers include not being able to cover as much content, limited preparation time for class, large class sizes and the lack of materials and equipment.

Having enough time to cover the content is a barrier to using cooperative learning. One illustration cited by Bonwell and Eison (1991), refers to a student in a math class asking the teacher to explain the last concept again. The teacher replied, "if your going to interrupt me with questions, we'll never be able to cover the material". The study admittedly shows the pressure exerted on teachers to cover the material in a short period of time.

Another barrier to using active or cooperative learning in the classroom is preparation time for teachers. To effectively conduct a successful lesson plan, teachers need to be well prepared. In order to be well prepared, plenty of time to organize the lesson, gather the materials and create an instruction method needs to be present. With the endless demands on teachers to do other tasks, time becomes limited. Teachers end up planning late after school and during the weekends. According to teacher Al Willet

(2001), “there just are not enough hours in a day to do all the tasks required of teachers, nonetheless, creating new teaching strategies”.

Pressure on schools to increase class sizes is the next barrier to using cooperative learning. Budgets across the nation are being tightened and teachers eliminated to decrease the cost of teaching. Consequently, class sizes are increasing. Being able to control class sizes exceeding 30 students becomes difficult. Instead of managing 30 students working together, many times it is much easier to lecture and demand students to work quietly and independently.

The last barrier to using active learning models or cooperative learning is the lack of materials, equipment or funds. Generally, this is not a problem due to alternate instruction using less expensive materials such as poster board and tape. But when teachers want to turn lecture halls, where seats and a chalk board exist, into an active learning environment it requires money.

Barriers that inhibit the use of cooperative learning include, not being able to cover as much content, limited preparation time for class, large class sizes and the lack of materials and equipment. These factors contribute to why people, including teachers, tend not to change.

Summary

The review of literature covered six topics relating to cooperative learning. The topics included a comparison of cooperative learning to two “traditional forms” called competitive and individualistic learning. Next, an in-depth explanation of group theory followed by the five basic elements of cooperative learning was detailed. Then, the methods of cooperative learning were analyzed. Lastly, the positive benefits that take

place from using cooperative learning in classrooms and the barriers that inhibit the use of cooperative learning in classrooms was discussed.

Chapter 3

Methodology

Introduction

This chapter describes the subjects under study, how they were selected and the area from which they came. In addition, the instrument being used to collect information is discussed as to its content, face validity and reliability. Data collection and analysis procedures are then presented. The chapter concludes with some of the methodological limitations.

Description of Subjects

The subjects for this study were technology education teachers in CESA 10 & 11 in West-Central Wisconsin. The study included any certified technology education teacher who was currently teaching a technology education course within CESA 10 and 11. The name in Wisconsin for the license is called the 220 certification. The names of technology education teachers in CESA 10 & 11 were provided by the Department of Public Instruction. Technology education teachers who currently hold an emergency license were not included in this survey. The number of technology education teachers surveyed was one hundred and twenty-one. These teachers were chosen because previously, no study has been completed about cooperative learning in technology education within this region.

Information about CESA 10 & 11

Cooperative Educational Service Agencies (CESA) were created in 1963 and adopted into law in 1965 to take over for the county superintendent system which began in 1863. Nineteen CESAs were developed according to school district lines, replacing

the original 70 county lines here in Wisconsin. Due to operational and administrative costs, in 1984 the CESAs reorganized and formed 12 CESAs.

The organization of school districts in Wisconsin was created to form a link between the school district and the state superintendent. The cooperative educational service agencies were designed to serve educational needs in all areas of Wisconsin as acting as a link between school districts and the state. CESAs provide leadership and coordination services for school districts. They offer programs in curriculum assistance, management development, coordination of vocational education and exceptional education, data collection, research, special student classes, human growth and development and in-service programs.

Cooperative Educational Service Agencies (CESA) number ten is geographically located in West Central Wisconsin. Employment within the area includes the following major groups: Manufacturing, government, trades-retail and whole sale, agriculture, self employed and domestics, services and miscellaneous. Agriculture and agri-business related industries have provided a primary economic base for many of the thirty school districts with the exception of the Eau Claire metropolitan community. The CESA ranks high in diversification of industry.

With a total enrollment of 38,964 students k-12, the smallest district is Weyerhaeuser with 241 students and the largest is Eau Claire with 11,439 students according to the Wisconsin Department of Public Instruction (2000). A breakdown of the total number of students in a district fell into two ranges, primarily. The first range was between 0 and 1,000 students, which included 20 school districts. The second range was between 1,000 and 2,000 students, where 8 school districts landed. The final two schools

districts had 4,546 and 11,439 students. The districts included within CESA 10 are as follows:

Abbotsford	Altoona	Augusta
Bloomer	Bruce	Cadott
Colby	Cornell	Chippewa Falls
Eau Claire	Eleva-Strum	Fall Creek
Flambeau	Gilman	Gilmanton
Granton	Greenwood	Ladysmith
Loyal	Medford	Lake Holcombe
Mondovi	Neillsville	New Auburn
Spencer	Owen-Withee	Osseo-Fairchild
Stanley-Boyd	Thorp	Weyerhaeuser

According to the annual report put out by CESA #10 (1999-00), "the primary purpose of CESA #10 is to provide direct and indirect instructional, instructionally-related, and management and administrative services to local school districts to support and assist those districts in providing quality educational opportunities on an equitable basis to all students with the greatest possible degree of educational effectiveness and economic efficiency." (p. 11)

Cooperative Educational Services Agencies (CESA) number eleven is geographically located in North Western Wisconsin. Employment in the area was once primarily agriculture and agri-business but now has a variety of job opportunities. Jobs include manufacturing, government, trades-retail and wholesale, self-employed, domestics and many other opportunities. CESA #11 consists of 39 school districts.

According to the Wisconsin Department of Public Instruction (2000), a total enrollment of 47,678 students were in k-12, where the smallest district is Birchwood with 333 students, and the largest is Hudson with 3,951 students. A breakdown of the total number of students in a district fell into three ranges. The first range was between 0 and 1,000 students, where 19 school districts fell. The second range was between 1,000 and 2,000 students, where 14 school districts landed. The third range was between 2000 and 3000 students, where 4 schools were. The final two schools districts had 3,384 and 3,951 students. The 39 school districts included within CESA 11 are as follows:

Amery	Luck	Baldwin-Woodville
Menomonie	Barron	New Richmond
Birchwood	Osceola	Boyceville
Pepin	Cameron	Plum City
Chetek	Prairie Farm	Clayton
Prescott	Clear Lake	Rice Lake
Colfax	River Falls	Cumberland
St. Croix Falls	Durand	St. Croix Central
Elk Mound	Shell Lake	Ellsworth
Siren	Elmwood	Somerset
Frederick	Spooner	Glenwood City
Spring Valley	Grantsburg	Turtle Lake
Hudson	Unity	Webster

CESA #11 provides leadership to help schools in their goal of bringing every student high levels of achievement while keeping it cost-effective. It also supports schools with different joint services and activities but also researches creative ways of organizing and funding services for schools. According to Rykal (1996), the mission statement for CESA #11 is to "Serve Educate And Lead" by "Providing thoughtful, quality educational leadership and service by working together for life-long learning." He also goes onto list three goals which include:

> Goal 1: Develop quality services to meet the needs of our learning communities.
>
> Goal 2: Seek a shared understanding of best educational practices which are based on experience and research about teaching and learning.
>
> Goal 3: Develop leadership that is visionary, creative and research based, and meets the changing and diverse needs of learners. (p. 5)

Instrumentation

A thirty-one question survey was developed to measure the level of utilization of cooperative learning being used in classrooms, the level of barriers teachers have implementing cooperative learning strategies, the amount of training teachers have had in cooperative learning and demographic questions (See Appendices A, for a copy of the instrument).

The first survey item asked subjects to circle whether or not they ever put students into groups of 2 or more and work on activities together in their classrooms. If they

answered “yes” they were instructed to continue with the rest of the survey items. On the other hand, if they answered “no”, they were asked to skip to item number fifteen, which was the section on barriers of using cooperative learning. They were asked to skip to number 15 because item numbers 2 through 14 did not pertain to them if they didn’t put students into groups of 2 or more.

Survey items were grouped accordingly to their content. The level of implementation of cooperative learning in classrooms was found by comparing variables in survey items 2-14. According to Johnson and Johnson (1991), there are five basic elements of cooperative learning which include individual accountability, positive interdependence, face-to-face interaction, interpersonal skills and group processing. These elements were broken down into sub-variables that included either 2 or 3 statements on the survey.

Survey items 2, 3 and 4 were used to determine the level of individual accountability that was present in technology education classrooms. Participants were asked to circle one of four choices which included, “always” which was worth 4 points, “frequently” which was worth 3 points, “occasionally” which was worth 2 points and “never” which was worth 1 point. This scale was used repeatedly in this section on all of the following sub-variables. The average score of these three items was used to provide a score to indicate the level of individual accountability being used inside classrooms.

Next, survey item numbers 5 and 6 were used to determine the level of positive interdependence present in technology education classrooms. The average score of these two items was used to provide a score indicating the level of positive interdependence being used inside classrooms.

Then survey item numbers 7 and 10 were used to decide the level of face-to face interaction being used in technology education classrooms. The average score of these two items provided a score indicating the level of face-to-face interaction that was being used.

Survey item numbers 8 and 9 were used to determine the level of interpersonal skills being used. The average score of these two items was used to provide a score to indicate the level interpersonal skills were being used.

Lastly, survey item numbers 11 and 14 were used to determine the level of group processing that was being utilized. The average score of these two items provided a score to indicate the level of group processing being used.

Survey item numbers 12 and 13 were used to break up the monotony of the basic elements of cooperative learning. These items were actually derived from procedures that technology education teachers "should not" use within the classroom. These items were not included when deciding if the basic elements of cooperative learning were being used within technology education classrooms.

The higher the average score indicated a higher level of activities that fall within the definition of the essential elements of cooperative learning. To decide as a whole whether or not the basic elements of cooperative learning were being used in technology education classrooms, survey item numbers 2, 3, 4, 5, 6, 7, 10, 8, 9, 11 and 14 were averaged to provide an overall score indicating a level of cooperative learning.

The next section of the survey instrument (survey item numbers 15-22) was developed to conclude the perceived level of obstacles that teachers face while implementing cooperative learning in classrooms. According to Bonwell and Eison

(1991), there are many obstacles that interfere with the implementation of cooperative learning into classrooms. Obstacles used in the study include curriculum, training, time and classroom management.

Survey item number 18 concluded whether or not "curriculum" was a factor when teachers used cooperative learning in the classroom. The survey asked participants to circle one of four choices which included, "always" which was worth 4 points, "frequently" which was worth 3 points, "occasionally" which was worth 2 points and "never" which was worth 1 point. Similar to the last section, this scale was again used repeatedly. The average score of this item was used to determine if curriculum was an obstacle to the implementation of using cooperative learning.

Survey item number 22 was used to conclude the level to which "obtaining training in cooperative learning techniques" was an obstacle. The average score of this item provided a score indicating the level to which this was perceived to be an obstacle.

Survey item numbers 16, 19 and 21 were used to conclude the level to which "classroom management" was an obstacle to implementing cooperative learning methods. The average score of these items was used to determine the perceive level to which this obstacle had an effect on using cooperative learning in classrooms.

Survey item numbers 15, 17 and 20 were used to determine the level of which "time" was a factor in the implementation of cooperative learning strategies. The average score of these items provided a score identifying the perceived level to which "time" is an obstacle to implementing cooperative learning in classrooms.

Lastly, to have an overall conclusion of whether the level of obstacles interfere with the implementation of cooperative learning in classrooms, an average score of

survey items 15 through 22 were provided to include all of the perceived obstacles to implementing cooperative learning in the classrooms.

The level of training or experience teachers have had in cooperative learning was found with survey items 23 through 28. Participants were first asked to read through statements about different types of training in cooperative learning and to place checks in the blanks that correspond to themselves. After they had read through the statements and checked the ones that they did, they then were asked to estimate the number of hours spent on each type of training or experience. Analyzing the number of training hours and the different types of training was used to find out the level of training teachers have in cooperative learning techniques.

The final three questions asked respondents to designate by circling the appropriate answer pertaining to demographics. Survey item number 29 asked subjects to circle their gender. Survey item number 30 asked participants to circle their age, and survey item 31 asked subjects to circle the number of teaching years they have had.

Development of the Instrument

The survey was checked for face validity by two University professors, with expertise in cooperative learning and survey development. Before administering or sending out the cooperative learning survey, it was also evaluated for use. Use is best explained by asking the subject whether or not the directions for the survey, were clear and understandable. The use was measured using a tool called a “survey of the survey”. The survey of the survey was given to fifteen Language Arts teachers at Eau Claire North High School. The fifteen Language Arts teachers were primarily chosen because of their expertise in spelling, grammar, punctuation and their attentiveness to detail. The teachers

were first asked to go through read and answer the cooperative learning survey, and then, fill out the questions on the use of the survey. As a result from the pilot study, the survey was modified to fit the needs of the fifteen subjects and the intent of the survey.

Data Analysis and Tabulation

Descriptive statistic statements were used to report the findings of the survey. Frequencies, percentages, standard deviation and mean scores were calculated for every question on the survey, also mean scores were used for certain variables and sub-variables throughout the survey. The research hypothesis were tested using the Pearson Product Moment Correlation Coefficient (r), two tailed, to determine the degree of relationship between the variables. The correlation hypothesis was tested at the .05 level. The Pearson (r) takes into account all scores in both distributions and is the most stable correlation measure. This is the most appropriate measure of correlation for this study. The statistical package for the social sciences (SPSS-X) was used for computer analysis at the University of Wisconsin-Stout.

Three correlations were calculated in this study. The first level of correlation was found by comparing the level of implementation of cooperative learning to the perceived level of obstacles encountered by technology education teachers. This was completed by looking at the average score of the level of implementation statistics and average score of the perceived level of obstacles encountered by teachers.

The second level of correlation was calculated by examining the results from the average score of the level of implementation of cooperative learning in classrooms and the level of training teachers have received in cooperative learning techniques.

The last level of correlation was found by comparing the results from the level of obstacles teachers encounter while using cooperative learning and the level of training or experience teachers have had in cooperative learning. This was completed by comparing the level of teacher training to the average score of the perceived level of obstacles that teachers encounter while implementing cooperative learning.

Data Collection

Surveys were sent to technology education teachers of CESA 10 & 11 in West-Central Wisconsin. On top of the survey, an explanation stated that this was a voluntary study. Teachers were assured that their answers to the survey were confidential and that their names would not be included in the final paper. The teachers filled out the surveys and then mailed them back in a self-addressed envelope to the researcher. The letters sent out were alphabet and number coded in order to retrieve surveys that were not returned in the specified time. For those participants who did not respond to the survey, a follow-up mailing was used. The second mailing was different from the first because the cover letter was reworded to address subjects as a second time recipient. The survey was the same as the first survey. The second mailing was sent nine days after the first mailing.

Chapter 4

Results

Introduction

The purpose of this study was to determine the relationship amongst three variables dealing with cooperative learning. The first variable was to determine the level of implementation of cooperative learning being utilized by technology education teachers in CESA 10 & 11. The second variable was to determine the perceived level of barriers that inhibit teachers from using cooperative learning, and the third, to find out the level of training technology education teachers in CESA 10 and 11 have had in learning about techniques in cooperative learning.

The data was gathered with a survey that featured items derived from the review of literature. The first section included demographic data and the amount of experience that the participants have had in teaching. The second section included the findings of the level of implementation of cooperative learning in technology education classroom in CESA 10 and 11. The level of barriers that inhibit the utilization of cooperative learning in technology education classrooms in CESA 10 and 11 is explained in the third section. The fourth section reported the level of training technology education teachers in CESA 10 and 11 have received in cooperative learning methods. The fifth section included the average scores of the levels of implementation, obstacles encountered while utilizing cooperative learning techniques and the level of training teachers have had in learning about cooperative learning. The last section specifies the correlations amongst the variables and the results of the hypothesis testing.

There were 121 licensed technology education teachers from CESA 10 and 11 that were surveyed. Out of the 121 educators asked to fill out the survey, 83 surveys were returned, resulting in a response rate of 70%. The first mailing yielded 72 surveys being sent back, while the second mailing received 11 of the surveys back. Consequently, the results of this study will reflect the opinions of the technology education teachers in CESA 10 and 11 that sent back the survey either on the first or second mailing.

Demographic Information

The first section of this chapter dealt with demographic questions. The first question asked teachers to identify their gender.

Table A

Demographic Information

	Gender	
Item Number:	Male	Female
29. What is your gender?	83 (100%)	0 (%)

Number of Valid Cases: 83

All of the respondents were male (see table A).

The next item dealt with the age of the participant. Participants had to circle the approximate age they were.

Table B

Demographic Information

	Age						
Item number:	20-25	26-30	31-35	36-40	41-45	46-50	Over 50
30. What is your approximate age?	0 (0%)	16 (19%)	8 (10%)	8 (10%)	16 (19%)	15 (18%)	20 (24%)

Number of Valid Cases: 83

The majority of the respondents were older (over 40 years old) male technology education teachers (see table B). Ironic as it may seem, there were no male technology education teachers between the ages of twenty and twenty-five.

The final question dealt with the number of years the respondents have been teaching. Participants were once again asked to circle the age that corresponds to them.

Table C

Demographic Information

	Number of years teaching						
Item Number:	0-5	6-10	11-15	16-20	21-21	26-30	Over 30
31. Approximately how many years have you been teaching?	14(17%)	16(19%)	9(11%)	5(6%)	16(19%)	17(21%)	6(7%)

Number of Valid Cases: 83

The number of years teaching was represented by just about every level of experienced teacher (see table C). Just under half (47%) of the teachers had over twenty years of experience.

The first item on the survey asked respondents to circle either yes or no to the following question. Since the start of the semester, have you put your students into groups of 2 or more to work together on an activity or assignment?

Table 1

Cooperative Learning Information

	Cooperative Learning	
Item number:	Yes	No
1. Since the start of the semester, have you put your students into groups of 2 or more to work together on an activity or assignment?	78 (94%)	5 (6%)

Number of Valid Cases: 83

A very large percent (94%) of the participants put students into groups of 2 or more to work together on an activity or assignment since the beginning of the semester. Only (6%) of the respondents indicated that they did not put students into groups of 2 or more and expected to work together.

Elements of Cooperative Learning

The next 13 items dealt with the level of implementation of cooperative learning that was being used in classrooms by technology education teachers. The section began by first asking teachers to read the following statement: "When your students are working in groups of 2 or more, how often do you…"

Item numbers 2, 3 and 4 focused on the level of individual accountability being used within technology education classrooms. Together they represent the overall

feelings of how individual accountability was being used in technology education classrooms in CESA 10 and 11.

Table 2

Elements of Cooperative Learning

	Level of usage			
Item number:	Always	Frequently	Occasionally	Never
2. Assign a grade to individual students based on the overall performance of the group as a whole	12 (15.4%)	34 (43.6%)	24 (30.8%)	8 (10.3%)
3. Assign a grade to individual students based on their particular contribution to the group's performance.	17 (21.8%)	41 (52.6%)	14 (17.9%)	6 (7.7%)
4. Assign each individual a grade for the group's overall performance and a grade for their unique contribution to the group's success.	17 (21.8%)	24 (30.8%)	22 (28.2%)	15 (19.2%)

Mean Score: 2.69
Standard Deviation: .65
Number of Valid Cases: 78

The respondents of the study created a consistent pattern throughout the three statements dealing with grading students after a group project. They answered either frequently or occasionally most often with percentages being 74.4 %, 70% and 59%. Always was circled quite often with 15.4%, 21.8% and 21.8% being used respectively. Never was used the least according to the respondents with 10.3%, 7.7% and 19.2% being used respectively. The overall mean score resulted in 2.69, which fell in between frequently and occasionally, but leaning towards frequently a little more.

Items 5 and 6 dealt with positive interdependence. It asked how participants how they structured their classroom to function as a team and work together on selected problems.

Table 3

Elements of Cooperative Learning

	Level of usage			
Item number:	Always	Frequently	Occasionally	Never
5. Give students a group production grade, an individual grade, and bonus points if all the members achieve the group's goal.	7 (9%)	20 (25.6%)	20 (25.6%)	31 (39.7%)
6. Assign roles for each member of the group to play during a learning activity (e.g., checker, encourager, recorder, scribe).	3 (3.8%)	20 (25.6%)	26 (33.3%)	29 (37.2%)

Mean Score: 2.00
Standard Deviation: .79
Number of Valid Cases: 78

Most respondents (65%) agreed that they either occasionally or never gave students a group production grade, an individual grade and a bonus grade if all members achieved the group's goal (see table 3). Only 7(9%) of the respondents agreed that they always used the three different types of evaluation types. Most respondents either never or occasionally use role playing in their classrooms. The overall mean score was 2.00, which fell directly onto occasionally.

Items 7 and 10 dealt with face to face interaction. The questions asked subjects to describe how they have students interact with one another in class.

Table 4

Elements of Cooperative Learning

	Level of usage			
Item number:	Always	Frequently	Occasionally	Never
7. Have students encourage each other's learning by either coaching or teaching certain topics within their group.	18 (23.1%)	21 (26.9%)	28 (35.9%)	11 (14.1%)
10. Debrief students at the end of each work session to review how the group worked as a team.	9 (11.5%)	30 (38.5%)	24 (30.8)	15 (19.2%)

Mean Score: 2.51
Standard Deviation: .72
Number of Valid Cases: 78

The respondents circled either frequently or occasionally most often (62.8%) when asked how frequently they used students to encourage each other's learning by teaching or coaching certain topics within their group. However, a smaller portion (14.1%) answered never to the question.

Most of the respondents (69.8%) said the level at which they debrief students at the end of each work session on how they worked as a team was either frequently or occasionally. Half of that number either answered always or never if they ever use debriefing at the end of each work session.

Items 8 and 9 dealt with the use of inter-personal skills. It asked about the use of using leadership skills inside the classroom and conflict resolution to avoid problems.

Table 5

Elements of Cooperative Learning

	Level of usage			
Item number:	Always	Frequently	Occasionally	Never
8. Teach or review leadership principles prior to implementing group projects or activities.	8 (10.3%)	23 (29.5%)	31 (39.7%)	16 (20.5%)
9. Present or review strategies for conflict resolution prior to starting a new group activity.	2 (2.6%)	13 (16.7%)	39 (50%)	24 (30.8%)

Mean Score: 2.10
Standard Deviation: .72
Number of Valid Cases: 78

The respondents answered either occasionally or frequently the most (69.2%) when asked how often they teach or review leadership principles before implementing group projects (see table 5). Respondents answered never (20.5%) when asked how often they taught leadership principles before implementing an activity.

Over eighty percent of the respondents indicated that they either occasionally or never presented or reviewed strategies for conflict resolution prior to starting a new group activity (see table 5). Coincidentally, the number of respondents that either frequently or always used conflict resolution strategies was very minimal (2.6%).

Items 11 and 14 dealt with the use of group processing skills. Participants were asked how often they used end of the work period group processing and whether or not a pattern or system was used to teach students.

Table 6

Elements of Cooperative Learning

	Level of usage			
Item number:	Always	Frequently	Occasionally	Never
11. Ask each group member to list 1-3 things that they could do to improve their group performance.	5 (6.4%)	14 (17.9%)	33 (42,3%)	26 (33.3%)
14. Use a pattern or system to organize students into groups and to do activities (e.g., think-pair-share and jigsaw).	7 (9%)	22 (28.2%)	31 (39.7%)	18 (23.1%)

Mean Score: 2.10
Standard Deviation: .65
Number of Valid Cases: 78

The majority of respondents (75%) did very little in the way of asking group members to list 1-3 things they could do to improve their group performance at the end of each work period (see table 6). Coincidentally, only a few (6.4%) participants always asked students to list 1-3 things that would improve the group's performance.

According to the results, most (67.9%) of the respondents either frequently or occasionally used a pattern or system to organize students into groups and to do activities (see table 6). Although, (23.1%) the participants reported that they never used patterns or systems to organize students.

The next two items asked teachers to circle the level to which they used cooperative learning in their classrooms. These two items were derived from the list of things that teachers perceive as being cooperative learning methods. These were not included in any of the basic elements of cooperative learning.

Table 7

Elements of Cooperative Learning

	Level of usage			
Item number	Always	Frequently	Occasionally	Never
12. Ask students who are finished with an assignment to help slower students complete the assignment.	29 (37.2%)	36 (46.2%)	9 (11.5%)	4 (5.1%)
13. Have students sitting close to one another talk through problems while working on their own assignments.	17 (22.1%)	35 (45.5%)	20 (26%)	5 (6.5%)

Mean Score: 2.99
Standard Deviation: .70
Number of Valid Cases: 78

For both of the questions, respondents circled either always or frequently most of the time when asked if they ever have students who are finished with an assignment to help slower students or sit next to another student to help them. The mean score was at 2.99, which concluded respondents frequently used these two methods to teach students.

Cooperative Learning Barriers

Tables 15 through 22 describe the level of perceived barriers technology education teachers in CESA 10 and 11 encounter while using cooperative learning techniques. Participants were first asked to read the following statement before answering any of the items. "When you want your students to work in groups of 2 or more, how often do you have difficulty…"

Items 15, 17 and 20 asked about dealing with the amount of time teachers needed to plan/develop lessons. These three questions determined whether or not time was a perceived barrier when implementing cooperative learning methods.

Table 8

Cooperative Learning Barriers

	Level of difficulty			
Item number:	Always	Frequently	Occasionally	Never
15. Finding the time to plan and develop lessons that use cooperative learning techniques.	6(7%)	32(38%)	39(47%)	6(7%)
17. Dedicating the time needed to grade and record individual as well as group performances.	10(12%)	39(47%)	28(34%)	6(7%)
20. Allocating the time needed to teach students how to work effectively as a team.	10(12%)	34(41%)	28(34%)	11(13%)

Mean Score 2.54
Standard Deviation: .64
Number of Valid Cases: 83

Most (85%)of the respondents agreed that finding the time to plan a lesson was a problem either frequently or occasionally (see table 8). Only a few (14%) of the respondents circled always and never.

The respondents favored circling frequently and occasionally the most often (81%) when it came to dedicating the time needed to grade and record individual and group grades (see table 8). A low number of respondents (19%) circled always and never when it came to recording grades.

According to the respondents (75%), the level of difficulty when finding the time needed to teach students how to work effectively as a team primarily fell between frequently and occasionally (see table 8). Few (25%) respondents felt the level of difficulty was never or always a problem (see table 8).

Items 16, 19 and 21 dealt with the problem of classroom management. Teachers were asked selected questions whether or not classroom management kept them from using cooperative learning in their classrooms.

Table 9

Cooperative Learning Barriers

	Level of difficulty			
Item number:	Always	Frequently	Occasionally	Never
16. Getting students to work and communicate effectively in groups.	6 (7%)	34 (41%)	40 (48)	3 (4%)
19. Keeping all the students within each group on-task for the entire period.	17 (21%)	36 (44%)	27 (33%)	2 (2%)
21. Monitoring each student in terms of his/her understanding of the content being addressed.	6 (7%)	38 (46%)	37 (45%)	2 (2%)

Mean Score: 2.64
Standard Deviation: .76
Number of Valid Cases: 83

An overwhelming majority (89%) of the respondents agreed either frequently or occasionally that getting students to work and communicate was a problem. Once again, very few (11%) participants circled either always or never.

The respondents frequently (77%) believed that keeping all the students within each group on-task for the entire period was a barrier (see table 9). Almost never (2%) did participants say that they thought keeping students on-task was not a problem.

Respondents (91%) once again favored either frequently or occasionally when asked if monitoring students in terms of their understanding of the content was a problem (see table 9). Hardly any (9%) respondents felt the level of difficulty was either always or never when monitoring student learning.

Item 18 dealt with the ability to match the curriculum up with the cooperative learning styles.

Table 10

Cooperative Learning Barriers

	Level of difficulty			
Item number:	Always	Frequently	Occasionally	Never
18. Matching the curriculum with the appropriate cooperative learning methodologies.	6 (7%)	26 (31%)	33 (40%)	18 (22%)

Mean Score: 2.24
Standard Deviation: .88
Number of Valid Cases: 83

A majority (71%) of the respondents believed matching the curriculum with the appropriate cooperative learning techniques is either frequently or occasionally a problem. The mean score was 2.24, which meant respondents felt that this barrier happened between frequently and occasionally, but closer to occasionally.

The last item dealt with the level of difficulty while training on cooperative learning methods.

Table 11

Cooperative Learning Barriers

	Level of difficulty			
Item number:	Always	Frequently	Occasionally	Never
22. Obtaining the training needed to implement different cooperative learning techniques.	8 (10%)	28 (34%)	33 (40%)	14 (17%)

Mean Score: 2.36
Standard Deviation: .88
Number of Valid Cases: 83

Most of the respondents believed that either frequently or occasionally that the training needed to implement cooperative learning methods was a problem (see table 11). The mean score was 2.36.

Level of Training in Cooperative Learning

The next section dealt with the level of training technology education teachers in CESA 10 and 11 have received. Survey item number 23, asked participants to indicate whether or not they read books about cooperative learning methods, and, if they did, to indicate how many hours did spent using this method. The level of training progresses and ends with asking respondents whether or not they have taken a graduate level course, and, if they did, how many hours of courses they had taken.

Table 12

Amount of Experience in Cooperative Learning

	Number of hours				
Item number:	0	1-2	3-4	5-6	>7
23. Read books and/or journal articles about using cooperative learning in my class.	18 (22%)	30 (36%)	15 (18%)	6 (7%)	14 (17%)
24. Worked with my colleagues to implement cooperative learning in our classes.	37 (45%)	18 (22%)	7 (8%)	7 (8%)	14 (17%)
25. Attended a conference presentation about implementing cooperative learning.	28 (34%)	22 (27%)	15 (18%)	6 (7%)	12 (14%)
26. Participated in an in-service workshop on cooperative learning techniques.	32 (37%)	18 (22%)	11(13%)	5 (6%)	17 (21%)
27. Received lessons on cooperative learning during my undergraduate program.	42 (51%)	14 (17%)	6 (7%)	9 (11%)	12 (15%)
28. Completed a graduate course that addressed cooperative learning strategies.	53 (64%)	7 (8%)	7 (8%)	2 (2%)	14 (17%)

Number of Valid Cases: 83

As the formal level of training in cooperative learning increases, the fewer the number of hours technology education teachers have in training about cooperative learning methods (see table 12).

Results of the Variables

This section of the chapter reports the average scores that were derived from the results of the respondents. The mean scores represent the average of the sub-variables below. Behind the variable, the sub-variables are listed.

Table 13

Results of the Variables

Elements of Cooperative Learning	Mean	S.D.
Individual Accountability (Questions #2, #3 & #4)	2.69	.65
Positive Interdependence (Questions #5 & #6)	2.00	.79
Face to Face Interaction (Questions #7 & #10)	2.51	.72
Interpersonal Skills (Questions #8 & #9)	2.10	.72
Group Processing (Questions #11 & #14)	2.10	.65
Overall Average (All Questions)	2.32	.51

Number of Valid Cases: 78

Each of the above averages represents the number of times respondents circled numbers ranging from 1 to 4. The survey instrument asked participants to circle one of four choices which included, “always” which was worth 4 points, “frequently” which was worth 3 points, “occasionally” which was worth 2 points and “never” which was worth 1 point.

Individual accountability was the variable that was most heavily used (2.69) according to table 13. Positive interdependence was the least used variable with a mean score of 2.00. The overall average score was 2.32, which meant teachers circled either frequently or sometimes most of the time, but leaned toward occasionally more often.

The following table represents the average score of the variables that teachers circled to represent how they felt about the level of barriers to implementing cooperative learning methods. The mean scores represent the average of the sub-variables if used, they are listed beside each variable.

Table 14

Results of the Variables

Barriers to Using Cooperative Learning:	Mean	S.D.
Curriculum (Question #18)	2.24	.88
Training (Question #22)	2.36	.88
Time (Questions #15, #17 and #20)	2.54	.64
Classroom Management (Questions #16, #19, and #21)	2.64	.52
Overall Average (All Questions)	2.51	.53

Number of Valid Cases: 83

Each one of the categories above represents the average of the sub-variables if any, that inhibit the utilization of cooperative learning techniques. The respondents perceived classroom management (2.64) to be a more of a barrier than any of the others, when implementing cooperative learning techniques. They also believed that fitting the curriculum into the different methods (2.24) was the least of their worries when using cooperative learning.

Participants were asked to check the types of training they have received and the amount of time they spent on each type. Table fifteen represents the numbers of respondents that answered yes and no to the different types of cooperative learning

training. The table also has the mean score for each type of experience that teachers received.

Table 15

Results of the Variables

Types of education in Cooperative Learning	Respondents Answer		Mean
	Yes	No	
#23 Read books/journal articles.	65	18	2.75
#24 Worked with colleagues to implement cooperative learning.	46	37	2.26
#25 Attended a conference presentation.	55	28	2.44
#26 Participated in in-service workshops about cooperative learning.	51	32	2.55
#27 Obtained lessons during undergraduate program.	41	42	2.11
#28 Completed a graduate level course on cooperative learning.	30	53	1.73
Total average number of training hours.	-	-	13.86

Number of Valid Cases: 83

The respondents averaged 13.86 hours of training in learning about cooperative learning methods. The range that participants could have received was between 0 hours and 42 hours of education in cooperative learning techniques.

Sixty-five out of 83(78.3%) respondents, have had some sort of experience learning about cooperative learning methods. But, only 36% of the subjects have

received a masters degree or are working on a masters degree and have received some training in cooperative learning methods.

Results of the Correlations

The final section in this chapter deals with the correlations amongst the variables. Each one of the variables is compared to the other variable to see whether or not there is a correlation. The numbers represent the three variables.

Table 16

Pearson's Linear Regression Correlation

	Correlation		
	1	2	3
1. Level of Cooperative Learning.	1.00 1.00		
2. Level of Barriers to Utilizing Cooperative Learning.	-.003 .979	1.00 1.00	
3. Level of Training Teachers Received	.347 .002	-.083 .456	1.00 1.00

Number of Valid Cases: 83

The correlation between the level of implementation of cooperative learning techniques and the perceived level of barriers that inhibit the use of cooperative learning was tested. The correlation coefficient was .003, which was not statistically significant at the .05 level. Therefore, the null hypothesis for this correlation was tenable.

The next correlation test was between the perceived level of barriers that inhibit the utilization of cooperative learning techniques and the level of training technology education teachers have received. The correlation coefficient was -.083, which was not

statistically significant at the .05 level. Therefore, the null hypothesis for this correlation study was tenable.

The last correlation tested was between the level of implementation of cooperative learning methods and the level of training teachers have had in cooperative learning techniques. The correlation coefficient was .347, which was statistically significant at the .005 level of significance. As a matter of fact, it would have been found significant at the .01 level. The null hypothesis was rejected for this correlation.

Chapter 5

Summary

Introduction

Chapter 5 will review all the findings from chapter 4 and then go on to summarize and discuss their implications. Demographic data and the amount of experience that the participants have received in teaching are reported in the first section. The second section includes the findings of the level of implementation of cooperative learning in technology education classroom in CESA 10 and 11. The third section contains the level of barriers that inhibit the utilization of cooperative learning in technology education classrooms in CESA 10 and 11. The level of training technology education teachers in CESA 10 and 11 have received in cooperative learning methods is reported in section four. The fifth section will evaluate the average scores of the levels of implementation, obstacles encountered while utilizing cooperative learning techniques and the level of training teachers have had in learning about cooperative learning. And the last section specifies the correlations amongst the variables.

Demographic Data

According to the results of the study, 100 percent of the respondents were male. This suggests that the technology education program has an unbalanced male to female ratio. This reflects that we are still not successful at attracting females to the field. These numbers are even lower than state and national averages.

There are more older (over 40 years of age) technology education teachers than younger (less than 40 years of age) technology education teachers. Sixty-one percent of the teachers that responded said they were at least forty-one years old. The highest

number of teachers that fell into a category was 20 teachers, at 51 years of age and older (see table B). Most of the technology education teachers in CESA 10 and 11 have been out of school for over 20 years. Even though, possibly to keep up their license, they may be going back for additional education or striving for a master's degree. With this information in mind, one could expect that the shortage of technology education teachers that we are currently facing will continue for many more years.

Cooperative learning isn't a new type of active learning method, but it has been focused on more over the past few years in order to increase the achievement of students in schools across the nation. Having a technology education teaching staff that is older, leads us to believe that the teachers may have not researched or even been introduced to the proper teaching of cooperative learning techniques. If most of our teachers have not learned the proper methods of cooperative learning, more than likely it is not being taught successfully inside classrooms.

It is also interesting to note that there were not any 20-25 year old respondents. One may conclude that students out of high school are taking more than five or six years to receive a bachelors degree in technology education, or that they aren't getting into the teaching field until after they are over 25 years old. As some of the older (over 40 years of age) technology education teachers retire, one would expect this to shift, and to begin having younger teachers coming into the field.

Another possible explanation for not having any 20-25 year old respondents, is that technology education teachers may not be starting college until they have worked one to three years before enrolling in the programs to become technology education teachers. This way they are gaining some practical hands on experience before becoming

a teacher. Or one may speculate that being a first or second year teacher, they were too busy to respond to the survey.

The last demographic question asked respondents to approximate the number of years they have been teaching technology education. If one would speculate that the number of years teaching technology education would correspond to the age of the respondents, they would be correct. Over forty percent of the respondents said they have over twenty years of experience. Ironically, teachers with 0-5 years of experience were almost 17 percent of the population. Remember, the age of the respondents didn't include any 20-25 year old teachers. In other words, technology education teachers aren't beginning teaching until they are at least 25 years old or older.

The Level of Cooperative Learning Implementation

To begin the survey, teachers were first asked to determine whether or not they ever put students into groups of 2 or more and then had them work together. This question was asked first because some teachers do not put students into groups of 2 or more throughout the year, and it would be wasting their time answering the questions dealing with the level of cooperative learning techniques. Teachers that answered no, were instructed to proceed to number 15, which began the section on the barriers of cooperative learning. Respondents that answered yes were asked to complete the entire survey. Seventy-eight (94%) respondents answered yes, and 5 (6%) respondents said they did not put students into groups of 2 or more.

The exact reason why respondents answered no, was not determined with this survey, but can be speculated in the barriers section of this chapter. Possibly, the reasons may be as simple as the curriculum does not fit the teaching style or the teacher did not

believe in the method due to barriers that inhibit the implementation of cooperative learning. Some classes were created by professionals, for example, commercial module lab vendors, which do not promote cooperative learning. Other times, classes are based primarily on the individualistic and competitive learning styles which promote independent learning and a competitive learning atmosphere respectively.

According to Johnson, Johnson and Smith (1991), cooperative learning has five basic elements that need to be present before a teaching style can be considered an effective cooperative learning method. The five elements include individual accountability, positive interdependence, face to face interaction, inter-personal skills and group processing skills. The results of this study concluded that the level of implementation of cooperative learning methods is low. To explain this in more detail, each basic element of cooperative learning will be discussed.

Individual accountability has a low level of usage according to respondents from the study. This is evident by carefully examining selected questions within each basic element of cooperative learning. On item number 2, subjects were asked the frequency that they assigned a grade to individual students based on the overall performance of their group as a whole. Twenty four (31%) respondents agreed that they occasionally, assign a grade to students based on the overall performance of their group. Eight (10%) respondents said they never assign a grade to individual students based on the group as a whole and on the contrary, 12 (15%) subjects always used this type of grading system.

Survey items 3 and 4 had a similar breakdown of where respondents circled their answers compared to item 2 (see table 2). Item number 3 asked subjects the frequency to which they assign a grade to individual students based on their particular contribution to

the group's performance. Item number 4, asked respondents if they assign each student a grade for the group's overall performance and a grade for their unique contribution to the group's success. In conclusion it is safe to say that individual accountability is being used very little in technology education classrooms in CESA 10 and 11.

Positive interdependence had a lower level of implementation than individual accountability. Survey item number five asked subjects if they gave students a group grade, an individual grade, and bonus points if all the members achieve the groups' goal. Seven out of 78 (9%) respondents agreed that they always gave these three different types of grade. Thirty-one (40%) respondents indicated never, the most on this question and the rest of the subjects circled either frequently or occasionally. Having forty percent of the respondents circle never, leads one to believe that positive interdependence is not being used in CESA 10 and 11. Teachers must have difficulty finding the time to grade students in these three ways.

Survey item number six also depicts the level of positive interdependence being used in technology education classrooms in CESA 10 and 11. It asked teachers the level to which they assign roles, such as a checker, recorder and an encourager for each member of the group to play during a learning activity. Very similar results occurred compared to item number five (see table 3). Very few (4%)respondents said always, and most (58.9%) of the respondents either circled occasionally or never, when asked if they used role playing in their cooperative learning methods. After seeing the results of items five and six, it is hard to believe that individual accountability is being used consistently in technology education classrooms in CESA 10 and 11.

Face to face interaction also has a low level of usage according to the survey given to technology education teachers. When teachers were asked if they ever have students encourage each other's learning by either coaching or teaching certain topics within their group, 18 (23%) answered always. Half (50%) of the respondents either circled frequently or occasionally. The rest, which was 11 subjects (14%) agreed that they never use this type of teaching style. The other question asked teachers the level to which they debrief students at the end of each work session to review how the group worked as a team. Only nine (12%) respondents said they always use this strategy and the rest ranged from frequently to never with 30 (39%) subjects frequently using this method. Very few respondents used face to face interaction while using cooperative learning methods, thus representing a low level of utilization.

Inter-personal skills also had a low level of usage in technology education classrooms in CESA 10 and 11. Survey item eight asked subject the level to which they teach or review leadership principles prior to implementing group projects or activities. Survey item 9 asked respondents their level to which they present or review strategies for conflict resolution prior to starting a new group activity. Both of the results from these questions were very similar. Very few (10.3% and 2.6%) respondents said they always use both of these strategies in their classrooms (see table 5). For both of these questions most of the respondents (40% and 50%) answered occasionally. Inter-personal skills had a low level of usage in technology education classrooms.

Group processing once again, had a low level of implementation of cooperative learning methods in technology education classrooms in CESA 10 and 11. Survey item 11asked teachers the level to which they ask each group member to list 1-3 things that

they could do to improve their groups' performance. Survey item 14 asked respondents the level to which they use a pattern or system to organize students into groups and to do activities. Once again, results in both of the questions were very similar. Question number 11 only had 5 (6%) respondents that said they always used both of these strategies. Thirty-three (42%) respondents agreed that they occasionally ask each group member to list 1-3 things that they could to improve their group performance. Group processing is not being done in technology education classrooms in CESA 10 and 11.

As I noted before, according to Johnson, Johnson and Smith (1991), cooperative learning has five basic elements that need to be present before a teaching style can be considered an effective cooperative learning method. The results of this study concluded that although teachers are putting students into groups of two or more, they are not using strategies consistent with effective cooperative learning techniques. Effective cooperative learning techniques are not being used in technology education classrooms in CESA 10 and 11.

The Cooperative Learning Barriers

The perceived level of barriers that inhibit teachers from using active learning models such as cooperative learning have been concluded by Bonwell and Eison (1991) to be time, classroom management, curriculum and training. According to the results of the study, teachers perceive these barriers differently as will be noted in this next section.

Time is a barrier that prevents teachers from using cooperative learning in their classrooms. Survey item 15 asked teachers to circle the level to which finding the time to plan and develop lessons that use cooperative learning techniques was a problem. Six (7%) respondents answered always and 6 (7%) answered never to the question (see table

8). Thirty nine (47%) of the respondents agreed that occasionally, finding the time to plan and develop lessons that use cooperative learning methods was a problem.

Respondents were also asked the level to which they had problems with dedicating the time needed to grade and record individual as well as group performances. Thirty-nine (47%) of the subjects said that frequently they had difficulty finding time to grade students and 28 (34%) said occasionally they didn't have time for this task. Time is a barrier that inhibits the use of cooperative learning techniques in CESA 10 and 11.

Classroom management is perceived as a high level barrier that inhibits teachers from using cooperative learning methods in CESA 10 and 11. Survey item 19 asked teachers to circle the level to which they perceive keeping all the students within each group on-task for the entire period a problem. Seventeen (21%) respondents said that keeping students on-task was always a problem. Thirty-six (44%) of the subjects said frequently keeping students on-task was a problem. Together, sixty-five percent of the respondents either circled always or frequently, this leads one to believe that teachers perceive this to be a problem. Item 21 asked teachers if monitoring each student in terms of his/her understanding of the content being addressed was a problem. Only two (2%) respondents agreed that measuring student understanding was never a problem. Classroom management inhibits teachers in CESA 10 and 11 from using cooperative learning methods at a perceived high level.

Matching the curriculum with the appropriate cooperative learning techniques was not considered a problem according to technology education teachers in CESA 10 and 11. Eighteen (22%) respondents agreed that matching curriculum to cooperative learning techniques was never a problem. Thirty-three (40%) of the teachers said

occasionally this was a problem. Almost two-thirds of the respondents either agreed that never or occasionally matching curriculum was a problem. Evidently, teachers hardly ever have problems with matching curriculum to cooperative learning methods.

After researching information on the different cooperative learning methods, I have concluded that most of the techniques have been created for subject areas other than technology education. These techniques are curriculum created and fit well with only that type of content in mind. For example, STAD (Student Teams-Achievement Division) was created for math curriculum. After reviewing the last question about matching curriculum with the cooperative learning techniques, I believe most teachers don't use many different types of cooperative learning techniques. Because if they did, they would consider this barrier a problem, more often than not.

Obtaining the training needed to implement different cooperative learning techniques also seemed to not be an inhibitor of cooperative learning methods. Fourteen (17%) of the respondents agreed that obtaining the training in cooperative learning methods was never a problem (see table 11). Thirty-three (40%) of the subjects said occasionally obtaining the training was a problem. Only 8 (10%) of the subjects said obtaining the training was always a problem. Teachers in CESA 10 and 11 responded that obtaining the training in cooperative learning methods was hardly a problem.

The Level of Training in Cooperative Learning

Forty-two (51%) respondents from the survey agreed that they have never received any training in cooperative learning techniques during their undergraduate program (see table 12). The benefits of cooperative learning has been proven successful many times over in documented studies, yet students are graduating from universities

without any idea about the most successful learning techniques available. Eighteen (22%) of the respondents have never even read books and/or journal articles about using cooperative learning inside their classrooms. Why do professional educators expect teachers to use this style of teaching when they have never have been introduced to the methods and told about the positive effects of them?

Even though forty-two respondents said they have never received any training during their undergraduate program, some of the respondents may have not have attended school for their undergraduate program for nearly twenty years. Actually, over half of the respondents are over forty years old, which means it may be possible to say that they haven't been in school for nearly twenty years. Twenty years ago, cooperative learning methods were not a priority in education like it is today, with public schools being under the fire for poor performance.

Upon graduation from the university teachers should have been introduced to many different types of cooperative learning techniques. Some teachers may even have had the opportunity to apply one or two of the methods during their undergraduate program. Whether having experienced a class about cooperative learning techniques or just hearing about them in teacher lounges, teachers should be inspired to give some thought to this positive learning style. Once they have graduated with a bachelor of science degree in technology education or an industrial teaching degree, they should have the professionalism to continue their learning at their own rate. Even though, universities need to take responsibility for graduates in order to prepare them to be successful teachers. Teachers need to be responsible for implementing the teaching technique that fits their curriculum and teaching style that will make their students the most successful.

Results of the Variables

Throughout this section the mean scores will be used. While interpreting the mean score it is important to understand how that number was derived. Teachers were asked to complete the survey by circling the best answer to each question. The answers were labeled "always" being worth 4 points, "frequently" being worth 3 points, "occasionally" being worth 2 points and "never" being worth 1 point. For every survey item, the total number of points that were circled were added up and then divided by the number of surveys. For each variable, the questions that encompassed each were added and then divided by the total to derive at a mean score.

Although, it was not the intent of this study, the basic elements of cooperative learning can be ranked according to their level of implementation into technology education classroom in CESA 10 and 11. These rankings were derived from the mean scores. The element that is used the most is individual accountability with a mean score of 2.69 (see table 13). Face to face interaction was utilized second with a mean score of 2.51. Inter-personal skills and group processing were next with a mean score of 2.10. And finally, positive interdependence was use the least with a mean score of 2.00.

According to Johnson, Johnson and Smith (1991), all of the elements of cooperative learning need to be used all of the time before it can be considered effective. As you can tell by the mean scores (see table 13), the basic elements are not being used consistently by technology education in CESA 10 and 11. All of the scores fall in between 2.00 and 2.69, which means that teachers use the basic elements of cooperative learning somewhere in-between occasionally and frequently.

The perceived barriers to the utilization of cooperative learning can also be listed according to their mean scores. Classroom management had the highest level of perceived problems with a mean score of 2.64 (see table 14). Teachers rated time next with a mean score of 2.54. Even though time was scored below classroom management, it was not far below considering 2.64 compared to 2.54. According to the results, next came the problem of obtaining the training needed to successfully teach cooperative learning methods. It had a mean score of 2.36. The barrier that was perceived the lowest was the ability to connect curriculum with cooperative teaching methods that teachers used inside their classrooms.

As the level of training in cooperative learning techniques increased, the number of teachers attending decreased. At the basic level, respondents were asked whether or not they have ever read books and/or journal articles about using cooperative learning in their classes and 65 (78%) agreed they have (see table 15).

Teachers were then asked if they ever participated in an in-service workshop on cooperative learning techniques. Fifty-one (61%) of the respondents agreed they have attended an in-service workshop on cooperative learning methods (see table 15).

Lastly, subjects were asked if they have ever completed a graduate course that addressed cooperative learning strategies. Thirty (36%) of the respondents agreed that they have attended a graduate level class dealing with cooperative learning methods (see table 15). At the lower level of training in cooperative learning, many teachers have received some form of training. But, as the level of training increased, the amount of teachers enrolled decreased.

The correlation between the level of implementation of cooperative learning techniques and the level of barriers that inhibit the use of cooperative learning turned out to be not statistically significant. The null hypothesis for this corellational study was tenable. One can not conclude that a relationship exists between the level of implementation and the level of barriers.

The next correlation tested was between the level of barriers that inhibit the utilization of cooperative learning techniques and the amount of cooperative learning education teachers have had. Again, the amount of correlation determined was not statistically significant. The null hypothesis for this correlational study was tenable. One can not conclude that there is a relationship between barriers and training in these findings.

The last correlation was between the level of implementation of cooperative learning methods and the amount of education teachers have had in cooperative learning techniques. The null hypothesis was rejected for this correlation. The amount of correlation determined was statistically significant at the .01 level. The level of implementation of cooperative learning methods was correlated with the level of training technology education teachers have had learning about cooperative learning techniques. As the level of implementation of cooperative learning methods increased, the level of training teachers received in cooperative learning techniques also increased. Teachers who receive proper training will more than likely implement cooperative learning than those who do not.

As the level of implementation of cooperative learning methods increased student's achievement also increased according to the review of literature. If student

achievement increases with the increase of the level of implementation of cooperative learning techniques, teachers should be obtaining more training about the different types of cooperative leaning methods. Teachers need to receive more training or have more experiences with cooperative learning methods in order to increase student achievement.

Major Findings

1. There are not any females in technology education in CESA 10 and 11.
2. Many technology education teachers aren't getting into the teaching field until after they are over 25 years old.
3. There are more older (over 40 years of age) technology education teachers than younger (under 40 years of age) technology education teachers in CESA 10 and 11.
4. The level of implementation of cooperative learning methods in technology education classrooms in CESA 10 and is low.
5. Only half of the respondents received training in cooperative learning techniques during their undergraduate program.
6. Over two-thirds of the respondents have never taken a graduate level course on cooperative learning methods.

Recommendations of the Study

1) To conduct an extensive study with a larger group of technology education teachers.

2) Research on qualitative factors that may prove the levels of usage of cooperative learning techniques clearer.

3) Research on qualitative factors that may prove the levels of barriers of cooperative learning methods clearer.

4) There appears to be a problem getting females into technology education in CESA 10 and 11. Therefore, a study needs to be done that will identify the reasons why women are not getting into technology education in this area.

5) Increase training in cooperative learning techniques to teachers in CESA 10 and 11.

6) Increase workshop opportunities in cooperative learning techniques.

7) Determine who always used all of the basic elements of cooperative learning techniques versus who didn't always use the basic element of cooperative learning methods.

8) To conduct a study that would determine the relationship between years of experience of the teacher and the level of cooperative learning methods being used.

9) To conduct a study that would determine the relationship between the age of the teacher and the level of cooperative learning techniques being used.

Conclusion

Public schools pride themselves on preparing students for the future. The future for many students involves working in-groups. Many of the skills that workers now need are the ones that will allow them to work together effectively in small groups. Using cooperative learning techniques in technology education classrooms will prepare students for the future and improve their level of achievement.

To increase student achievement, technology education teachers need to obtain a higher level of training in cooperative learning methods. When technology education teachers receive training in cooperative learning methods, they respond by using a higher level of cooperative learning activities.

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APPENDIX A

Readability/Use Survey Instrument

Readability/Use Survey Instrument

This evaluation tool is being used to determine the use and readability of ***the Cooperative Learning in Technology Education Survey*** you have just completed. Please answer each of the questions below. Your answers are greatly appreciated. Thanks, Jan.

Return of Survey:

1. Were you aware that the survey was to be returned by March 21st? (Circle one)
   Yes No
2. Were you aware that the survey was to be returned in the self-addressed envelope? (Circle one)
   Yes No

Demographics:

3. The directions were clear regarding the demographics. (Circle one)

No Opinion	Strongly Disagree	Disagree	Agree	Strongly Agree
0	1	2	3	4

4. What suggestions would you make to improve the clarity of the demographics section? (Please explain)

Directions:

5. The explanation in the cover letter was clear regarding the purpose of the instrument. (Circle one)

No Opinion	Strongly Disagree	Disagree	Agree	Strongly Agree
0	1	2	3	4

6. The font size of the text was easily read. (Circle one)

No Opinion	Strongly Disagree	Disagree	Agree	Strongly Agree
0	1	2	3	4

7. The directions throughout the instrument were clear understandable. (Circle one)

No Opinion	Strongly Disagree	Disagree	Agree	Strongly Agree
0	1	2	3	4

8. What suggestions would you make to improve the clarity of the directions? (Please explain)

Cooperative Learning:

9. The instrument questions and statements were clear and easily read? (Circle one)

No Opinion	Strongly Disagree	Disagree	Agree	Strongly Agree
0	1	2	3	4

10. What suggestions would you make to improve the clarity of this section? (Please explain)

APPENDIX B

Cooperative Learning Survey Instrument

Cooperative Learning in Technology Education

This survey will ask you to look at the different ways in which you use cooperative learning in your technology education classes. It will also ask you a few questions about some of the common factors that support or inhibit the use of cooperative learning in technology education. Your cooperation in this study is greatly appreciated and all your answers will be anonymous.

1. Since the start of the semester, have you put your students in groups of 2 or more to work together on an activity or assignment? (Circle one) Yes or No

If your answer to this question was "No," please skip to item 15.

Directions: Teachers use cooperative learning techniques in different ways. Please read the following statements very carefully and answer questions using the scale provided below.

4	**3**	**2**	**1**
Always	Frequently	Occasionally	Never

When your students are working in groups of 2 or more, how often do you…

2. Assign a grade to individual students based on the overall performance of the group as a whole.	4	3	2	1
3. Assign a grade to individual students based on their particular contribution to the group's performance.	4	3	2	1
4. Assign each individual a grade for the group's overall performance and a grade for their unique contribution to the group's success.	4	3	2	1
5. Give students a group production grade, an individual grade, and bonus points if all the members achieve the group's goal.	4	3	2	1
6. Assign roles for each member of the group to play during a learning activity (e.g., checker, encourager, recorder, scribe).	4	3	2	1
7. Have students encourage each other's learning by either coaching or teaching certain topics within their group.	4	3	2	1
8. Teach or review leadership principles prior to implementing group projects or activities.	4	3	2	1

9. Present or review strategies for conflict resolution prior to starting a new group activity.	4	3	2	1
10. Debrief students at the end of each work session to review how the group worked as a team.	4	3	2	1
11. Ask each group member to list 1-3 things that they could do to improve their group performance.	4	3	2	1
12. Ask students who are finished with an assignment to help slower students complete the assignment.	4	3	2	1
13. Have students sitting close to one another talk through problems while working on their own assignments.	4	3	2	1
14. Use a pattern or system to organize students into groups and to do activities (e.g., think pair share, jigsaw, numbered heads)	4	3	2	1

Directions: Using cooperative learning techniques in technology education classrooms and laboratories can be challenging and problematic. Please read the following statements very carefully and answer each question using the scale provided below.

4	**3**	**2**	**1**
Always	Frequently	Occasionally	Never

When you want your students to work in groups of 2 or more, how often do you have difficulty…

15. Finding the time needed to plan and develop lessons that use cooperative learning techniques.	4	3	2	1
16. Getting students to work and communicate effectively in groups.	4	3	2	1
17. Dedicating the time needed to grade and record individual as well as group performances.	4	3	2	1
18. Matching the curriculum with appropriate cooperative learning methodologies.	4	3	2	1
19. Keeping all the students within each group on-task for the entire period.	4	3	2	1

20. Allocating the time needed to teach students how to work effectively as a team.	4	3	2	1
21. Monitoring each student in terms of his/her understanding of the content being addressed.	4	3	2	1
22. Obtaining the training needed to implement different cooperative techniques.	4	3	2	1

Directions: Teachers learn about cooperative learning through different forms of training. Review the list below. Please put a check mark next to the type(s) of training that you have received and circle the approximate number of hours that were dedicated to cooperative learning during the training in question.

	Number of Hours			
23. ____Read books and/or journal articles about using cooperative learning in my classes.	1-2	3-4	5-6	More than 7
24. ____Worked with my colleagues to implement cooperative learning in our classes.	1-2	3-4	5-6	More than 7
25. ____Attended a conference presentation about implementing cooperative learning.	1-2	3-4	5-6	More than 7
26. ____Participated in an inservice workshop on cooperative learning techniques.	1-2	3-4	5-6	More than 7
27. ____Received lessons on cooperative learning during my undergraduate program.	1-2	3-4	5-6	More than 7
28. ____Completed a graduate course that addressed cooperative learning strategies.	1-2	3-4	5-6	More than 7

(Continued onto the next page)

Directions: Lastly, I just need to know a few things about you as a participant to my study. Please read the following questions and circle the most appropriate answer.

29. What is your gender? (circle one) male or female

30. What is your approximate age? (circle one)

20-25 26-30 31-35 36-40 41-45 46-50 Over 50

31. Approximately how many years have you been teaching technology? (circle one)

0-5 6-10 11-15 16-20 21-25 26-30 Over 30

Thank you for taking time out of your busy schedule to complete this survey.

Questions or concerns about participation in the research or complaints should be addressed to the researcher or the research advisor and second to Dr. Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 HH, UW-Stout, Menomonie, WI, 54751, phone (715) 232-1126.

APPENDIX C

Cover Letter to Technology Education Teachers

Jan W. Bowe
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Dear colleague,

I am very interested in your ideas about the use of cooperative learning in technology education classrooms and laboratories. I realize that this is an extremely busy time of the year for you, and there are numerous demands being placed on your time. However, being a classroom teacher at Eau Claire North High School myself, I have designed this survey so it can be completed in about 3 minutes. Once you have finished filling out the survey, please place it in the self-addressed envelope and drop it into the mailbox before March 21.

Your input into this study can help inform future undergraduate/graduate classes and teacher in-service workshops. Results from the study will be published at the University of Wisconsin Stout Library in the thesis section. Your participation in this study is strictly voluntary and in no way will your identity be associated with the findings or conclusions. Thank you for your time.

Sincerely,

Jan Bowe