

FIFTH GRADE TEACHERS USE OF COOPERATIVE LEARNING IN SCIENCE

A Dissertation

by

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## ABSTRACT

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This study aimed to explore Cooperative Learning theories and practice by examining the relationships among three aspects: Experience, Practice and Perceptions. The data were from interview records from eight science teachers.

As a student-centered active pedagogical trend, cooperative learning has become part of one of the most effective and efficient educational trends that has illuminated constructivist science classrooms in South Texas. This method is conducive in the field of education. Students, in general, are encouraged to cooperatively get involved and to collaboratively participate in problem solving, discussions, and/or productions in group sessions to build a sense of community with the teacher's facilitation to incorporate cooperative learning strategies. This qualitative case study will examine scholarly frameworks of the Cooperative Learning Model for Academic Achievement and the link between 5th grade Science teachers' instructional expertise. Therefore, cooperative learning is significant enough that it can develop and/or sustain a constructive learning environment conducive for all learners alike. Cooperative learning is a constructive pedagogical trend that can be effectively applied to elementary science.



## DEDICATION

Completing my doctoral degree would not have been possible without the love and support of my two sons, Dylan and Landyn Jimenez, my mother, Maria Del Socorro Colmenero-Gonzalez, and my dogs, Jerry, Hershey, and JoJo. The completion of my doctoral degree would not have been possible without the guidance and dedication of my professors: Dr. Zhang, Dr. Lewis, Dr. Diaz Beltran, and Dr. Belinda Gomez. Thank you all for traveling with me through this vigorous journey.



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## CHAPTER I

### INTRODUCTION

Currently, fifth-grade elementary educators face the task of obtaining the supplies/resources needed to implement cooperative learning strategies, the time to plan appropriate cooperative lessons, and attend professional development opportunities. Traditional pedagogy is not sufficiently effective with the development and change of today's evolution of the digital era and technology progress to develop students' critical thinking, democratic problem-solving, and decision-making skills. Alternative pedagogical methods and strategies can improve elementary students' learning. Cooperative learning is one of these effective learning/ pedagogical strategies to transform and empower students' learning.

### **Cooperative Learning**

As cited in Simpson and Jackson (2003), John Dewey declared that instruction was moving from the present experience of the child out into the curriculum or organized bodies of the knowledge. This process of reconstruction support students as they shifted from current experiences into new realms of experiences. As such, it included the student's past, present, and future experiences as she or he moved into adult forms of knowledge and creativity highlighting the attitudes, the motives, and the interests in knowledge making. Dewey also proposed that providing isolated objectives was the way to instruct and, "To not move in this

direction is to inhibit the intellectual growth of the students” (Simpson & Jackson, 2003, p. 25). Dewey continued asserting that “understanding the whole child as well as our own helped us to mentally connect with each other” (Simpson & Jackson, 2003, p. 25) while in their learning environment. He adds, “If the teacher’s adult mind is poorly developed, she or he will be handicapped in understanding the child’s life and mind and poorly prepared to direct the development of the child” (Simpson & Jackson, 2003, p. 25). Lastly, Dewey added that “the teacher’s adult understanding enables her or him to create learning environments that are needed in order to promote the child’s growth” and “facilitate the growth of the student as she or he develops a knowledge-enriched and reflective mind” that was conducive to the learning environment (Simpson & Jackson, 2003, p. 25-26). According to Barbieru (2016), John Dewey accentuated how “children learned in an active student-centered environment. Learning through experience had a greater influence than learning through only the use of memory” (Barbieru, 2016, p. 71). Since experience developed understanding, it fostered an active environment. John Dewey’s constructivist learning theory (as cited in Dat-Tran, 2013) claimed learning takes place through social interactions that creates new knowledge from previous knowledge learned to reconstruct new ideas in social environments.

Subsequently, Piaget, Vygotsky, and Dewey (as cited in Dat-Tran, 2013,) shared their views on the cognitive theory which stressed that individuals developed, learned, assimilated, and accommodated due to each other’s knowledge and skills taking place during the cooperative learning activities among the groups social interactions generating active learning. “Piaget’s developmental theory emphasizes the involvement and participation of learners in the learning and thinking process. In the learning process, learners construct and reconstruct knowledge by themselves” (Dat-Tran, 2013, p. 106). Slavin (as cited in Dat-Tran, 2013) wrote that Vygotsky’s view in “cooperative activities among children promotes

growth because children of the same age work in one another's ZPD and model behaviors, which is more effective than children working individually" (p.106). In short, Vygotsky focused on social interaction while Piaget focused on cognitive development, yet they both intertwined cohesively.

Albert Bandura's social learning theory (as cited in Dat-Tran, 2013) indicated that individuals learned also by observing and reciprocating the behaviors of others in their own social environment causing retention of the skills being taught. Bandura proposed that "social learning theory is derived from a combination of environmental and psychological factors, including retention, the ability to reproduce the behavior, and the motivation to adopt the behavior" (Tozer et al., 2011, p. 469).

Piaget's "Constructivism is an epistemology or meaning-making theory, that offers an explanation of the nature of knowledge and how human beings work" (Abdal-Haqq, 1998, p. 1). It stated that people learned, created, and constructed wisdom utilizing what they already knew and integrating it with new knowledge to form new perspectives, ideas, and experiences. Bruner's constructivist theory was that learners built new visions and beliefs by understanding them through similarity with previous information. This implies the learning was not about simply being exposed to new information but was an active process whereby learners examine, code, decode, and interpret new concepts and ideas.

### **Research Studies Provided Sufficient Evidence**

According to Baloch and Brody (2017), in 1949, Morton Deutsch held a study on the outcomes of peer cooperation and competition. "The findings from this study challenged the widely accepted belief that students who compete work better than students who cooperate to facilitate their own and each other's learning" (Baloch & Brody, 2017,

p. 274). According to Baloché and Brody (2017), the results indicated that cooperative learning was not widely used and that the beliefs of the teachers, coupled with the perceived pressures of time and curriculum, were important determinants of usage. Baloché and Brody (2017) suggested that supplying teachers with the tools, answers, and clarifications can sustain a strong scholarship for them:

Instead, they emphasize (a) examining beliefs; (b) identifying problems; utilizing research as a foundation for innovation; (d) understanding context and thinking incrementally; (e) building communities for inquiry, experimentation, and support; (f) being willing to fail; and (g) recognizing when something does not work. Since these were some deep challenges, they may not always be easy to implement or learn (p. 281)

### **The Challenges of Implementing a Cooperative Learning Approach**

Since cooperative learning was well recognized for its efficient benefits like communal enrichment, cognitive effects, and enthusiasm, it still has challenges in implementation due to the engagement and instructional methods needed (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 296). “This research aims to document these challenges at the elementary school levels, exploring teachers’ beliefs regarding learning as well as the difficulties teachers report when implementing cooperative learning” (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 296).

According to Buchs, Flippou, Pulfrey, and Volpe (2017), there are six challenges they have uncovered: The first challenge is difficulty in properly implementing cooperative learning principles because it takes preparation and controlled grouping; the second challenge is locus of responsibility and authority where the entrustment is passed on to the student and their individual learning; the third challenge is the teacher’s role as a facilitator where the teacher assists, guides, and directs/redirects student learning only; the fourth challenge is alignment with curriculum

because teachers have difficulty incorporating and aligning cooperative learning strategies with the core curriculum which is not designed to incorporate such strategies; the fifth challenge is class and preparation time where teachers report difficulties on in class time management and time consuming planning and organizing; and the sixth challenge is assessment in cooperative learning where “Evaluation may be perceived as challenging for two reasons: teachers have to make decisions regarding the assessment of two objectives (academic and cooperative learning), and also decide how to deal with the question of interdependence in the evaluation” ((Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 298-299).

Buchs, Flippou, Pulfrey, and Volpe (2017) affirmed that “In sum, this survey regarding challenges for cooperative learning implementation pointed to the importance of pedagogical convictions (teachers’ beliefs regarding learning) and pragmatic obstacles (time needed and curriculum constraints)” (p. 304). This study recommends that staff developers concentrate on these challenges due to its findings of 32% of cooperative learning implementation by teachers in a classroom setting (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 304).

### **Teachers’ Reflections on Cooperative Learning**

Gillies and Boyle (2010) wrote that teachers faced challenges when they were reluctant to release control and accountability over to the students due to not having the full understanding or preparation for cooperative learning. Gillies and Boyle (2010) continued to write:

It is important that teachers understand how to embed cooperative learning into the classroom curricula to foster open communication and engagement between teachers and students, promote cooperative learning investigation, problem-solving and reasoning, and

provide students with an environment where they feel supported and emotionally secure (Gillies & Boyle, 2010, p. 934)

The purpose of this study was to examine teachers' reflection on cooperative learning: issues of implementation. Gillies and Boyle (2010) were to expose teacher perceptions of cooperative learning and what were the challenges they experienced. However, they did find difficulty in time management, preparation, organization, student adjustment, and class control. They report that "In sum, this survey regarding challenges for cooperative learning implementation pointed to the importance of pedagogical convictions (teachers' beliefs regarding learning) and pragmatic obstacles (time needed and curriculum constraints)." (Gillies and Boyle, 2010, p. 304). This study recommended that staff developers concentrated on these challenges due to its findings of 32% of cooperative learning implementation by teachers in a classroom setting.

### **Integrations of Cooperative Learning Resources**

Ghaith's (2018) mixed-methods study included a cluster random sample of 18 EFL teachers from the Republic of Lebanon. The results indicated that Original Jigsaw, Jigsaw II, and Think-Pair-Share were harmonious with the participants' practice while Student Teams Achievement Divisions were not supportive and Learning Together required resources not sustained by school guidelines. Among the participants, "cooperative learning is valued as an important pedagogy for achieving communicative competence and social cohesion" (p. 17).

Student Teams Achievement Divisions was not as aligned due to curriculum. Consequently, "This underscores the role of the curriculum and its desired learning outcomes as important factors in the perception and applications of cooperative learning as a proven student-

centered pedagogy” (Ghaith, 2018, p. 17). Creative Controversy was considered the most significant because it promotes communication stemming into Think-Pair-Share, Learning Together, Jigsaw, and Group Investigation providing equivalent prospects in an autonomous atmosphere (Ghaith, 2018, p. 17). Lastly, the cost and challenges of cooperative learning were controlled by the cooperative learning attributes. It was found that Think-Pair-Share and Jigsaw were low in cost and difficult to apply, in contrast to Student Teams Achievement Divisions and Learning Together. It adds that “As for the attractive cooperative learning pedagogical aspects, the participants particularly praised team competition in Student Teams Achievement Divisions, expert discussion in Jigsaw II, positive interdependence in Learning Together, individual accountability and presentation in Group Investigation” (p. 18). This study focused on the significance of putting the content and practices parallel to the curriculum and its aims. Ghaith (2018) suggested that:

As such, it is recommended that planners of in-service and pre-service programs identify and focus on the cooperative learning methods that serve the curriculum goals and objectives to be targeted by the program participants, so as to save resources and ensure better chances of cooperative learning implementation. This is particularly important in the context of national reforms and large-scale professional development initiatives, in educational contexts characterized by limited material and human resources. (p.18)

In Texas, students face the drop-out challenges. Science performance achievements were low due to the influence of the No Child Left Behind Act (2002) (Lee, 2023), and considerable awareness has been attracted to the point that some sub-units of public-school children across our country did not perform as well as their peers. Some findings have demonstrated a wide learning achievement gap between numerous school children in the United States. Scholars at the Washington Center for Equitable Growth concluded that if America could enhance teaching

implementation for the ordinary school child, each one would show gains. This gap was too broad and optimistic change did not come immediately. Progressively finishing this achievement gap was a stride in the right course. Desilver (2017) commented that the U.S. ranked behind more than 33 advanced industrialized countries that made up the Organization for Economic Cooperation and Development when it came to math and science scores.

### **My Colleagues' and My Experience**

My colleagues and I believed in the importance of engaging cooperative learning to find entry points to meet each student's diverse learning style and needs. The students cooperatively engaged in diversely with an abundance amount of interaction, discussions, and shared knowledge. Doing so meant examining the characteristics and components of the overall cooperative learning process. The importance of the opportunity to cooperatively connect with classmates in new ways was considered entry point to freshly gained knowledge to increase student academic knowledge and achievement. The success of the cooperative learning process was based on the group's performance drawing from each student's individual identity.

### **Research Focus**

Elementary teachers face a challenge when they want to change the pedagogical strategies in Rio Grande Valley. The traditional pedagogical strategies cannot sufficiently improve elementary students' learning. The alternative pedagogical model such as cooperative learning is crucial to today's learning. However, several factors block the elementary teacher from using the cooperative learning strategy. The lack of resources for implementing group work activities hinders the teacher's capacity to fully carry out cooperative learning. The teacher tries to generate or produce learning resources by asking parents for help. The parents are

provided a supply list of materials teachers may need. In doing so, not all materials are provided, only some. Therefore, teachers have to fill in the rest of the supplies needed by asking for donations from businesses or they provide their own by purchasing some of the materials needed to fulfill the lessons. This causes a financial problem for teachers when trying to purchase materials needed or required for cooperative learning. The school also provides materials, but resources are limited as the school is only offered a limited budget. Therefore, there are at least three factors that hurdle science learning in elementary schools: a) lack of cooperative learning, b) insufficient supplies, and c) insufficient parental involvement and engagement.

The first factor is that time is a hurdle for teachers to do cooperative learning. The implementation of cooperative learning takes time. When teachers get together to plan, they take time into consideration. Due to timing, some activities can be implemented. If not, the lesson has to be modified. The lesson objective still remains the same though. That means the outcome has to be fulfilled because in 5<sup>th</sup>—grade science is state tested through the state test known as STAAR. STAAR stands for the State of Texas Assessments of Academic Readiness.

The second factor is that of supplies. When implementing cooperative learning, supplies are crucial. They are used in creating solutions for science objectives. They are used for hands-on activities for students during pairing or group work. These hands-on activities help the students better understand how a solution is reached cooperatively through their own creations. It allows the students to discover and bring to life their own understanding to share with their group and the teacher.

The third factor is parental involvement and engagement. It takes parental involvement to fulfill some of these activities. Not all materials can be provided by the teacher or the school.

Thus, the schools ask the parents to bring in some of the supplies and resources, which are needed to fulfill their child's educational needs. When parents get involved, it makes learning much more meaningful. It also helps in engaging the student in their individual learning. This helps in merging the lesson's objective and the student's learning outcome while successfully implementing cooperative learning. The student takes ownership of their individual learning.

### **The Purpose of the Study**

The purpose of this study research is: (1) to examine 5th grade Science teachers' perceptions of cooperative learning, (2) how their practices impact teaching and learning in a classroom of diverse learners, and (3) how their professional experiences impact the challenges they face. This study is designed to look at the affiliation between the teachers' practices, the teachers' perceptions, and the teachers' experiences with cooperative learning implementation.

This study is to explore the teachers' perceptions. The educator's mission during cooperative learning includes the motivation of constructive collaborations between students. To accomplish this, it is necessary for the educator to organize student contacts from the perspective of educational assignments and at the same time, organize the students for collaborative work with others. Therefore, in preparation for and implementing cooperative learning, educators have many decisions to make. In the planning phase of cooperative learning, there are many questions to think about, how much time to give students for group work, and how the activities will be effectively structured. These issues require the consideration of educators when planning cooperative learning lessons.

This study is to examine how teachers' experience impacts the challenges they face for the insufficiencies of science learning strategies and the lack of the supplies needed for cooperative learning implementation. The student's performance is shaped by the quality and the

extent of instructional and learning resources. Student and teacher performance can be attributed to the adequacy of educational achievement and success. Student resources and supplies are crucial when implementing cooperative learning because they motivate students to learn as well as stimulate what they are processing.

Lastly, the study is also concerned about the parental involvement and engagement in their children's learning because they need to provide additional learning resources for the teachers to implement cooperative learning activities in their lessons. This may cause parents to positively contribute to their child's academic success. But some parents may not see it that way and would want the school or the teacher to contribute instead. Engaging the parent is essential for academic and student development. This may promote the student's overall success.

### **The Significance of the Study**

Understanding of examine 5th grade Science teachers' perceptions of cooperative learning and discovering the reason why they have the current perception will help teachers and administrators know the reason and solve the problem of providing teachers and students with the necessary resources to achieve academic success in the classroom. Cooperative learning enhances the teacher's personal liability. The goal is to perform each specific task for the whole group to thrive. The teachers also have that accountability among the grade level to prosper in their role. The teacher's mission entails productive connections that stimulate the learners. Therefore, they need to prepare the students to interface their educational assignments concurrently.

The teachers' perceptions influence their teaching and learning philosophy and pedagogical strategies. Understanding their beliefs can improve the professional development plan. Teachers' perceptions influence their teaching performance and learner growth, steering

their determination and relations with their students. Their perceptions support teachers in shaping their lesson planning, curricular outcomes, and recognizing what should be taught in the classroom. Aligning it to their teaching perceptions and philosophy, teachers will be able to base the academic content around the views of the students. In turn, teachers can also perceive their actions by how the students react. It is a learning environment created for everyone to work together toward student achievement.

The research findings will provide information and feedback to the office/institutes of professional development on how to improve the professional development programs. This research will support the teacher's growth professionally while amplifying their professional knowledge. It will also help examine the teachers' own practice and measure their individual expectations of themselves in their work environment. Thus, teachers may utilize professional development to acquire new and up-to-date knowledge and resources. Professional development serves as a construct for their conceptual understanding of their individual work ethic. Professional development will provide new perspectives of other learning and/or academic examples, teaching reflection, and complement gains to their expertise.

The research findings can suggest the school district curriculum development office with the model/ opinions of the learning/ pedagogical strategies. Curriculum development can suggest a series of pedagogical strategies for teachers to use as additional instructional resources and practices to formulate assessments based on the state TEKS and/or district goals to monitor student growth. Research-based strategies in school curricula may emphasize modeling, guiding students, and using new material in a time frame. Thus, teacher learning can be supported with curricular development focused on teaching and learning strategies connected with certain

curriculum subject matter. Effective instructional and learning strategies can be flexible enough to use across grade levels and subject areas.

### **Research Questions**

This study will provide an overview of the educational rapport between cooperative learning and the teacher's instructional beliefs. So, the following questions guide the study to explore the relationships between pedagogical strategies and instructional beliefs:

1. What are the teachers' perceptions about implementing cooperative learning?
2. How do the teacher's beliefs impact teaching and learning?
3. How does the teacher's efficacy influence their practice with professional development?

### **Target Group**

I, the researcher, targeted fifth-grade elementary educators because they are facing the challenge the task in obtaining the supplies needed to implement cooperative learning strategies, the time to plan appropriate cooperative lessons, and attend professional development opportunities. Also, as the educator, the author knows this group of teachers very well. The teachers have been employed in the same campus and grade level for more than five years. They each have obtained numerous hours in professional development in math, reading, writing, and science. They plan at least twice a week for the upcoming week or weeks. This is done in preparation for obtaining the supplies needed in advance. They also do data analysis on assessments or benchmarks conducted to monitor the students' progress and teaching practices. Through cooperative learning, the teachers keep the students engaged and motivated to continue learning. In return, the teachers get the results they need for academic achievement.

### **The Immediate Problem-Solving Solutions**

As described in the purpose of the study, this case study aims: (1) to examine 5<sup>th</sup>-grade Science teachers' perceptions of cooperative learning, (2) how their beliefs impact teaching and learning in a classroom of diverse learners, and (3) the experiences they must have to face challenges. This study is designed to look at the affiliation between cooperative learning implementation, the teachers' instructional beliefs, and the challenges they encounter with cooperative learning implementation. This study examine how teachers face challenges for the shortage or the lack of the supplies needed for, and insufficiency of science learning strategies with cooperative learning implementation.

All these aspects referenced above are to find out immediate problem-solving solutions rather than exploring any theoretical dimension. Teacher perceptions are crucial in the classroom because their training, experiences, and observations are relevant to recognize the needs of learning. Their perspectives can have a positive or negative impact on academic achievement and student expectations. Therefore, the challenges they face need to be overcome whether it be with school funding, donations, or even purchasing the supplies themselves. These teachers influence learning, academic skills, engagement, and motivation when teaching. Making sense of the world around is the key element when expressing ideas and teaching.

### **Research Method**

There were two qualitative methods used in this study, descriptive case study and constructivist grounded theory. I adopted a descriptive case study to describe the participants' descriptions of cooperative learning and science education in the interview data. For example, how did the science teachers apply cooperative learning to their science teaching in the classroom and relevant learning environments?

Constructivist grounded theory and Saldana's model will be used in this research study. The purpose of the application of these two methods in the study is to increase the construct validity and further explicate the structure being developed based on the data. Constructivist Grounded Theory focuses on discovering recurrent themes that uncover relationships using the decoding of expressions and words, obtained during the teacher interviews. Through the interviews, I could construct principles from the data collection of the teachers. The purpose involves getting data to examine the teachers' perceptions of implementing cooperative learning to better understand their needs. The data collected helps me gain insight into cooperative learning implementation and its challenges. The Saldana Model is used for the coding in the themes collected to extract crucial data analysis that will simplify coding for comprehension. The decoding will further clarify cooperative learning implementation and its challenges confronting the teachers in the classroom.

### **Assumptions**

Assumption 1: About the data collection. I believe that all the information provided by these teachers can be trusted. These teachers wanted to solve the problems in their pedagogical and classroom administrative/managing processes. For one, time is valuable for school teachers. Some school teachers would claim that they in no way have sufficient time to get to every student, especially the ones that are below grade level. Thus, every moment a teacher has with their students should be profound and constructive. Cooperative learning teachers set up techniques and anticipations that decrease inefficient lost time and increase participating learning prospects. To achieve this task, they need the learning resources they mostly lack.

Assumption 2: The information collected is located in the Southern Texas school district.

Thus, it is believed that the data will reflect the fact and issues in the local school district.

Teachers should be trained with engaging means encompassing the state standards they are obliged to instruct. Thus, financing has a substantial influence on student accomplishment. A shortage of financing normally starts with bigger class sizes alongside fewer curriculum materials, and the more students a teacher has the fewer learning resources. This limitation can turn out to be substantial when you have differing scholarly student levels.

Assumption 3: Teachers' opinions and perspectives on cooperative learning can be analyzed in either quantitative, qualitative, or mixed methods designs and even in advanced composite modes. However, I do not want to seek any agreements and comparisons among these methods. I believe that all these opinions and perspectives as data can be analyzed and further support the local school district administrative teams to solve the problem. The followings are the examples of the opinions and perspectives that teachers may have.

1. Teachers look at cooperative learning as time-consuming. It takes away time from the lesson and therefore it needs preparation to conduct such activities. Cooperative learning activities need to be ready ahead of time so the lesson can be successful. If it is not planned carefully, the teacher might look at it as complicated to perform, and students might get confused in the process. So, teachers might get discouraged to incorporate cooperative learning activities in class. Planning is crucial for cooperative learning activities to be incorporated since it is done with groups of students. The students need to know the objective, activities need to be explained thoroughly, and a learning outcome needs to be reached. Teachers need to facilitate instruction during this time so students can be guided during the learning process to reach the intended learning and teaching outcomes.

2. Teachers may also be reluctant to incorporate cooperative learning in class due to the lack of supplies needed for such activities. Cooperative learning requires “hands-on” participation in group work to actively engage students in the learning process. To ensure that supplies are at hand, teachers may need to ask parents, school administration, and/or community stakeholders for donations to be able to provide the differentiated instruction students need to accomplish the learning outcome. Thus, this may bring a negative attitude to teachers toward cooperative learning due to the lack of supplies. They may find such learning tasks difficult to achieve and educational objectives not attained. They may also find themselves purchasing supplies that are needed for group work to ensure the lesson goes as planned. This expense may cause the teacher to hesitate and even prevent him or her to integrate cooperative learning activities overall.
3. Teachers need to allow students to interact and communicate with one another to ensure student engagement and motivation to occur among students during cooperative learning activities. This approach stimulates their learning among the group, and thus students take ownership of their learning individually to formulate their own learning perspectives represented by the other students. This outcome allows the students’ efficacy to flourish in the learning process during group work. Since group work allows cooperation and collaboration, different student perspectives are exposed, permitting students to reach the learning objective.

### **Limitations Related to Both Descriptive Case Study and Grounded Theory**

The limitations are the things related to my design, the research problems, or the research questions. The study adopted two qualitative study designs. Descriptive case study and grounded theory with a social constructivist perspective and Saldana’s data analysis model

(Saldana, 2020). The issues I wanted to focus on were both descriptive and analytical. The first question I asked was, what are the teachers' perceptions about implementing cooperative learning? The best response to this question was descriptive. However, the other three questions are analytical. Hence, a weakness of descriptive case study was that it cannot provide a comprehensive understanding of a phenomenon by proving/justifying theoretical linkages between components of such phenomenon in cooperative learning and science education. The grounded theory cannot recognize the embeddedness of the researcher and thus obscures the researcher's considerable agency in data construction and interpretation. I hope such a weakness can be improved by using descriptive case studies.

### **Limitations**

The limitations are the things related to your design, the research problems or research questions. The study is qualitative in nature with social constructivist perspective and Saldana's data analysis model (Saldana, 2020). The findings and results can be generalized sufficiently to other cultural settings across the nation. Some schools may or may not recognize the social constructivist perspective as part of their cultural setting due to their beliefs, values, and practices. Also, teachers in other cultural settings may relate to this study due to their society and ideas. Their own cultural setting may differ because of their attitudes and values. Thus, others may misinterpret or misunderstand the study itself due to language and/or philosophy. The regular flow of knowledge across the nation affects the cultural settings. Therefore, the dispersion of knowledge among teachers may differ upon their demographics. The demographics affect the cultural settings based on the practices and beliefs of the region.

The relatability of teacher's perspectives ensures the impact on teaching and learning. The hypothesis is opened. Stated differently, it is necessary for me to prove it. However, through the

data analysis, I became confident to confirm the arguments qualitatively. The teacher's perspectives impact student learning and expectations. If teachers believe strongly in their perspectives, the student learning outcome may reflect that belief. The teacher's lesson delivery and planning can leverage student learning. If the teacher's planning and academic achievement are in mind, then, the student outcomes may improve with the best result intended. The perspectives of teachers deeply affect what happens in the classroom. The teacher's perspectives and expectations do matter in their own effectiveness. If they are provided with the essentials to achieve student success, the goals set would be easier to obtain. For some teachers, success can be visibly measured in assessments as well as with student observations.

The composite qualitative analysis methods do not promise that this is the only method that can be used in the analysis; however, it is an effective method to do the study. I will check the qualitative reliability. The reliability is unique. There may be alternative ways to examine it. The subjects are credible trustworthy participants. They are certified teachers who practice the use of cooperative learning in their classrooms. They have years of experience between them. Through interviews, the research is transferable. This process is dependable due to the understanding nature of the research. It contains a solid research design that includes applicable procedures and is consistent with the research conducted.

### **Delimitations and Case Study Boundary by Time and Place**

I chose this course of study because at the time an abundance amount of cooperative learning studies was made in foreign countries. Most of those studies were based in high school or at a university level. Those studies were not chosen because they were too advanced for elementary school. Their prime focus was based in other areas like chemistry, economics, math,

computers, etc. Not too many studies are geared towards elementary school. Thus, the research was conducted in an elementary school. The research includes 5<sup>th</sup> grade teachers who implement cooperative learning in science. I felt that the open-ended question interviews were sufficient to demonstrate the challenges they face when implementing cooperative learning. A Likert scale was not necessary because a multiple-choice questionnaire was not issued like it would for quantitative research. This research was mainly based around Constructivism. The theory behind it is for learners to construct knowledge actively, adding newly acquired knowledge to the previously learned knowledge.

### **Case Study Boundary by Place, Time, and Culture.**

From the perspectives of case study, boundaries required researchers to scope their study. Researchers chose a bounded context which can contain a person, an organization, a class, a policy, or any given unit of study. Boundaries also help a researcher to define what will not be included in the study. First, the boundary of my study was that there were only several elementary science teachers who taught science. As data and evidence, the conversations were the data resources to develop both descriptive case study findings and grounded theoretical models, which sets the place boundary. Second, I finished the interview within three weeks, which establishes the time boundary. Third, all of these teachers taught in a Latinos cultural school district. Thus, I suggested the audience to notice the unique of the Latinos culture, which places a cultural boundary.

### **Definition of Terms**

**Cooperative learning** is when problem-solving is done in a small group where knowledge is obtained from a group to the individual.

**A process of reconstruction** occurs when perspectives are shared and compared to develop new knowledge.

**Social learning theory** is behavior that is learned or adapted from another to make its own.

**Constructivism** is the theory that builds their own knowledge by doing rather than by staying passive.

**STAAR** is the acronym for the State of Texas Assessment of Academic Readiness which is an assessment based on the standards known as Texas Essential Knowledge and Skills (TEKS).

**Parental involvement** is the participation of parents in the school and in the students.

**Parental engagement** entails when parents and staff work together to improve learning and the school environment.

**Teachers' beliefs** are personal principles or judgments made using their individual teacher experiences.

**Teachers' efficacy** builds on explicit experiences, effectively influential, highly confident, and strongly committed towards student learning and their profession.

### **Summary**

Cooperative learning is a teaching method used to acquire new knowledge gained from working in small groups to achieve a certain goal. Using Vygotsky's Zone of Proximal Development, the knowledge gained is attached to their prior knowledge allowing students to further explore other students' perspectives. The benefits are immense but with it also comes challenges. Challenges like not having enough supplies to carry out the activities or students not wanting to work with others. Although I show there may be some challenges, the teachers' beliefs are that they can be overcome.

## CHAPTER II

### LITERATURE REVIEW

In Chapter II, I reviewed cooperative learning and constructivism. The learning theories were stated by emphasizing several scholars who presented cooperative learning. These scholars included John Dewey, Jean Piaget, Lev Vygotsky, and Albert Bandura. Dewey accentuated cooperative learning, the learning environment, and students' experiences. Piaget advocated that the cooperative learning characteristics should be cognitive and developmental, Vygotsky's point of view was social constructivist, and Bandura suggested cooperative learning had an effective application in the social environmental conditions considering psychological factors.

I also reviewed constructivism in social constructivism, constructivist pedagogy, and constructivist classroom environments. The purposes were to establish associations between cooperative learning and constructivism. Thus, I attempted to highlight students' learning was cooperative learning under a constructivist framework.

Constructivism, thus, encourages and sustains cooperative learning. Since it's an innovative trend. Many educators and parents ask what cooperative learning is, and what it entails. Cooperative learning is a contemporary pedagogical method that reaches into various diverse groups to influence their academic capabilities using a multitude of methods and strategies that incorporates the student's Funds of Knowledge (Gonzalez, Andrade, Civil, & Moll, 2001) into both descriptive and constructive frameworks.

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entails. Cooperative learning is a contemporary pedagogical method that reaches into various diverse groups to influence their academic capabilities using a multitude of methods and strategies that incorporates the student's Funds of Knowledge (Gonzalez, Andrade, Civil, & Moll, 2001) into the teaching and learning presence of the classroom. An educational approach makes the association between the students' beliefs and their everyday capability to enrich deep awareness by utilizing the students' life experiences, ethnicity, and past knowledge jointly (Gonzalez, Andrade, Civil, & Moll, 2001). It entails students working collectively to attain mutual objectives or thorough sets of tasks leading to reading and writing successes in students, comprising those that educationally deferred, insubstantial comprehension in science, problem deciphering in mathematics, and advanced rational and scholarship (Gillies, 2014). Thus, there is no uncertainty that cooperative learning is a beneficial and advantageous method influenced by instructive revamps of current interludes.

Students come to their learning environment with their own experiences and knowledge. All students are unique in their own persona and their educational approach. Thus, Cooperative Learning's educational possibilities are endless. It includes students and teachers working cooperatively to allow various forms of knowledge to occur as instruction is controlled, facilitated, organized, and managed with academic content and instruction to meet each student's abilities. As Vygotsky and Laszlo (2010) emphasize that children learn through socialization and interaction while communicating using their own language (p. 247). This dynamic ties to the social constructivist theory that interaction occurs between people with various abilities and knowledge; thus, leading into Vygotsky's Zone of Proximal Development where children learn from others that are more knowledgeable (Lazlo, 2010, p. 247). Consequently, grouping and reasoning skills work in conjunction with the real world outside the classroom. They ought to be done collectively in the classroom environment (Halpern, 2011, p. 6).

## **Instruction and Pedagogies Strategies**

Sumarmi (2017) claims that utilizing enjoyable and expressive educational events transports learners into the realm of completely (p. 30). Therefore, educators are obliged to be engaging and creative to encourage academic growth among the students to provide learners with the extreme prospects to discover their capability in a learner-centered dynamic educational environment (Sumarmi, 2017, p. 30). In turn, those academic experiences can be more constructive through the student's lifespan when they are enthusiastically involved in the educational development (Sumarmi, 2017, p. 30). The learning activities are very crucial in a lesson since knowledge is an action or a procedure to obtain understandings, cultivate skills, expand performance, be assertive, and reinforce character to improve their doings and resourcefulness of learners (Sumarmi, 2017, p. 31). Consequently, high order questioning and critical thinking demonstrate the motivation to successfully achieve the learning objective (Sumarmi, 2017, p. 31). Cooperative learning is such a model that motivates engagement and cooperation in an active and engaging learning environment. In addition to working in small groups cooperatively, they can express each other's perspectives as part of problem solving. (Sumarmi, 2017, p. 31). The study conducted by Sumarmi (2017) in their classroom action research used the Round Table model and the Rally Coach model under cooperative learning which were both established by Kagan and Kagan. Their results are positively vivid which led cooperative learning to "(1) increase the activity of students in the form of visual, verbal, writing, listening and mental activity, (2) increase the motivation of students in learning activities, (3) affect student activity, (4) improve the ability to speak and communicate with other students, (5) improve social skills, and (6) improve student learning outcomes" (Sumarmi, 2017, p. 35). Overall, the study proves that the two models demonstrated an

increase in academic learning and social engagement as part of cooperative learning (Sumarmi, 2017, p. 35).

As for cooperative learning, research indicates that students derive understanding from other's perspectives. They could be educated to work in small groups with students' roles to help them achieve the objective successfully through communication, problem solving, and creativity (Gillies, 2014, p. 127). Gillies (2014) mentions that Johnson and colleagues conducted a meta-analysis to analyze the effects of cooperative learning and came to the conclusion that stimulates higher academic achievement to produce positive outcomes in all areas conducive of focused goals, student engagement, creativity, problem solving, collaboration, and communication while embracing differentiated learning among groups (p. 128). That research was conducted in 1981, but they did a follow up on it in 2002. That study signified that cooperative learning empowers the students to take control of their individual learning to help the group reach their academic goal and positive outcomes successfully through socialization and communication (Gillies, 2014, p. 128). Another researcher, Slavin, in 1996 also conducted similar research and his results indicated that if students are facilitated by the teacher by providing each student with roles in their group then they have the opportunity to take individual ownership of their learning to maximize the group's accountability and individual accountability by working cooperatively to achieve a positive outcome (Gillies, 2014, p. 128). In 2013, Slavin added that with the implementation of "Cooperative learning and metacognitive skills produce more positive effect sizes than those evaluating other curricula reforms or computer-assisted instruction" (Gillies, 2014, p. 129). As Johnson and Johnson, Slavin, and Gillies (2014) also contributed to research on Cooperative learning research and their results indicated that students are encouraged to conjoin in small groups with their roles and understand the function of that role so all in the

group can contribute in working together and problem solve together through cooperating and communication with each other to achieve the learning objective in the lesson (p. 129). In 2008, Roseth, Johnson, and Johnson contributed to the research by declaring that working together produces increased achievement among groups than being competitive with each other (Gillies, 2014, p. 129).

### **The Five Essentials**

Johnson, Johnson, and Smith in their 1991 study that cooperative learning has five essentials. The first is positive interdependence which is the certainty that what the group configures is upon the individual student success that together they can achieve the common goal they all have that includes a strong commitment to achieving success together (Jones & Jones, 2008, p. 66). This essential is the most challenging of the five essentials of cooperative learning to implement since it demands for each member of the group to provide their perspectives to the group in a cooperative way (Jones & Jones, 2008, p. 66). The next essential is face to face interaction that presents itself when students are given the opportunity to interact, communicate, collaborate, and problem solve among the group to complete the task provided which in turn the feedback provided to each other during the collaboration combines their prior knowledge with the new to create new perspectives (Jones & Jones, 2008, p. 67). The third essential is individual accountability that provides students with others perspective and experiences to strengthen their own knowledge as part of their individual learning process to help the individuals in the group also take individual learning ownership to achieve the final goal (Jones & Jones, 2008, p. 69). Another essential is social skills that with quality planning students can increase working together as a team while socializing and communicating during the cooperative learning task as well as collaborating amongst the

group members to provide their individual inputs to successfully reach the outcome together (Jones & Jones, 2008, p. 69). Lastly, group processing is the essential that offers the opportunity to express each other and provide each other feedback constructively to the group to promote cognitive knowledge while boosting group interaction and permitting for constant progress together (Jones & Jones, 2008, p. 71-72). When students generate effectively and efficiently, they produce individual accountability as per the group's evaluation after the final goal has been reached successfully (Altun, 2015, p. 452). Kagan and Kagan (as cited in Tamah, 2014, p. 200) asserted that "Individual accountability is making each student in the group accountable for his or her own learning." In doing so, it prevents others from taking credit from others other than for themselves. Each student must work independently performing their role to contribute to the group as part of taking responsibility for each other's learning together in an engaging and personal way to ultimately reach the group's goal (Tamah, 2014, p. 204). Using the diversity of groups, students can recognize their individual strengths and weakness while receiving or providing feedback to others to reach the mutual goal (Jones & Jones, 2008, p. 64). To conclude, if all the cooperative learning is included in the learning groups, students would demonstrate critical thinking skills, problem solving skills, communication, collaboration, and motivated and encouraged to work together with a more positive attitude in the learning process and subject area (Dat-Tran, 2014, p.132).

Additionally, according to Gull and Shehzad (2015), the "two major attributes that have distinguished cooperative learning from traditional learning include interdependence as well as accountability as each member of the group is important for success" (p. 27). "Cooperative learning also improves positive attitude towards learning, improved social relations, in addition to high self-esteem and cohesiveness" (p. 247). Positive interdependence is brought about when members accomplish the task successfully, fostering and motivating the

interaction between each other while individual accountability is assessed on their own work. In Gull and Shehzad (2015) study, they concluded that cooperative learning when used as a teaching approach has a constructive impact on students' academic achievement at the secondary level (p. 252). The outcome of working in groups brings about enhancing their self-perception, self-assurance, improving social abilities and heightened class involvement (p. 252). Thus, students sharpen their personal skills and enhance decision making. Heterogeneous grouping coincides with "Bandura's classic studies of self-efficacy, in which he found that modeling by someone who is similar to you can shape beliefs about your own ability and can increase motivation to achieve a goal" (Halpern, 2011, p. 5). Consequently, heterogeneous grouping can minimize discrimination and inequality after sharing various ways of considerable information during cooperative learning. When students are expected to relate knowledge that is being reiterated to others, the outcome is highly likely students will be able to recall information easily and successfully (Halpern, 2011, p. 8).

According to Dat-Tran (2013), Levin's social interdependence theory refers to individuals that are influenced by others to succeed and accomplish the goals of the group and/or individual (p. 105). Johnson and Johnson (as cited in Dat-Tran, 2013, p. 105) indicated that extrinsic motivation manipulates a person's aspiration to be achieved during social interdependence. Dat-Tran (2013) writes that when students work cooperatively, it has a positive effect while realizing their shared goal and may have a negative effect if and when students compete against each other (p. 105).

### **Critical Pedagogy**

As education evolves every year, it is crucial we stay current in educational learning strategies to meet our students' diverse needs as they progress through school. Transformation

is necessary to keep up with today's educational demands. It is crucial to discover the practices of educational principles, methods, and curriculum to confront and change the social imbalances in their school and society (Hidalgo & Duncan-Adrade, 2009, p. 262). The aim of cooperative learning is to break any social inequalities of diverse learners and cultivate its approach to its advantage to encourage a social change (Hidalgo & Duncan-Adrade, 2009, p. 262). In doing so, the development of critical pedagogy in the classroom can provide diverse learners with an elevated amount of significant scholarly consistency through cooperative grouping (Hidalgo & Duncan-Adrade, 2009, p. 264). A transformative approach in the classroom can aid in the possibilities of social learning and in the social responsibility of the students to resist any inequalities that might exist. The classroom can be a tool used to oppose resistance while critically liberating social interactions to account for pedagogical strategies to produce a beneficial positive social environment. Initially, "critical pedagogy brings oppressed students' histories, biographies, and systems of meaning into the classroom so they can 'name and authenticate their own experiences', which are often blatantly ignored by traditional curriculum and pedagogy" (as cited in Hidalgo & Duncan-Adrade, 2009, p. 266).

### **Culturally Relevant Pedagogy**

It is quite pedagogically appropriate to make meaningful connections to each individual learner to significantly achieve academic success. The relationship between school and culture when incorporated amplifies the foundation of good and relevant teaching in a classroom of diverse learners. Barrolome (1994) asserted that "humanizing pedagogy that respects and uses the reality, history, and perspectives of students as an integral part of educational practice" (as cited in Ladson-Billings, 2006, p. 286) maintains the empowerment of the teaching and learning environment that is culturally relevant. Despite unreceptive

classrooms and social inequalities, students must still build their own academic proficiencies in various ways. Through differentiated approaches, culturally relevant instruction necessitates that students retain some cultural reliability as well as educational merit (p. 287). In doing so, “culturally relevant teachers utilize students’ culture as a vehicle for learning” (p. 287) to achieve cultural competence merging learners into cooperative learning activities. Students are encouraged to incorporate their individual knowledge and experiences to encourage diversity to branch out as a resource to permit social and cultural competence, forming a cooperative and hostile free environment. “Knowledge is continuously re-created, recycled, and shared by the teachers and the students”, and “by using particular skills in context, students would become more proficient at those skills while acquiring new learning” (p. 290).

### **Culturally Responsive Instruction**

Culturally responsive instruction acknowledges and assists students’ values, dialect, and learning techniques in the curriculum and the classroom environment (Ogbu & Simons, 1998, p. 180). It cultivates the relationship between the student’s identity and the school’s prerequisites. In doing so, the student’s own experiences can be brought about to be shared and respected. Rather than try to limit the student’s social interaction and learning, it is appropriate to encourage culturally responsive behaviors into their classroom’s learning environment. In fact, research shows that “It helps teachers learn about their student’s culture and life experiences and communicates to the students that the teacher is interested in their world, which serves to validate their identity” (Ogbu & Simons, 1998, p. 181). Therefore, teachers can use this knowledge to incorporate in their lesson planning to increase student achievement and learning success while preserving their cultural identity in a culturally responsive pedagogical setting.

This type of classroom setting accommodates diverse learners during cooperative engagement. Student's learning styles are the target during the cooperative group learning activities. The six types of learning styles are described as: 1) Competition to outperform other students, 2) Cooperation to share knowledge and skills, 3) Avoidance to disengage from the learning process, 4) Participation to interact with others, 5) Dependence to rely on other to do the tasks, and 6) Independence to learn individually (Colak, 2015, p. 19). Since we all learn differently, cooperative learning meets individual needs by using a variety of differentiated delivery methods. Various scholars have written how cooperative learning increases academic performers, individual successes, critical thinking, theoretical practices, deep learning, and engagement through this instructional method (Colak, 2015, p. 19). Therefore, an essential objective of science learning is to assist students grow an interpretation of ideas and apply them when deciphering a challenge in a different setting (Celikten et al, 2012, p. 85). In addition, the aims of science instruction are to formulate a logically knowledgeable person who can explain the day-to-day difficulties about science (Tatar & Oktay, 2008, p.67). Nesbit and Rogers (as cited in Tatar & Oktay, 2008, p. 67-68) asserted that cooperative learning is an especially useful approach used in unraveling these challenges since it inspires people to clarify various point of views.

Slavin (as cited in Parveen & Batool, 2012, p. 154) emphasized that cooperative learning activities are thoroughly constructed learning activities in which students are held responsible for their involvement, contribution, and knowledge. Parveen & Batool (2012) also stated that cooperative learning is an instructional approach in students taking part in actions that stimulate partnership and communication (p. 154). According to Guthrie and Wingfield (2000), enthusiasm increases scholarly success, self-concepts, social connections, and thoughts regarding learning.

## **5E Instructional Model**

Constructivist learning theory grants a purposeful framework to strategically target the goals of science education and create new teaching and learning practices (Dasdemir, 2016, p. 22). Constructivist learning theory is when “a learner structures an understanding and utilizes it (Dasdemir, 2016, p. 22). “Taking into account educational research into how students learn science and the conditions which best promote science learning, it is evident that new understandings of the teaching learning process and the learning environment must be embraced, and new teaching strategies developed” (Dasdemir, 2016, p. 22). In science, it was found that the extremely successful paradigm of the constructivist learning theory, under cooperative learning, is the 5E Instructional Model which includes five phases: engage, explore, explain, elaborate, and evaluate (Dasdemir, 2016, p. 22). The engage phase presents learners with the chance to be informed of their own concepts relative to ideas on any notion (Dasdemir, 2016, p. 22). The discovery phase is where learners work in pairs, individually, or in a group to hold experimentations, investigate scientific learning via a compilation of atmospheres with the assistance of the educators, or they produce results to dilemmas (Dasdemir, 2016, p. 22). In the explanatory phase, learners depict and articulate the occurrences or ideas chosen under the direction of the educator to persuade students to change their inadequate or flawed experiences with appropriate scientific education (Dasdemir, 2016, p. 220). The detailed phase is where learners use new knowledge to a new or comparable situation and challenge in which learners discover new ideas which have not occurred prior to (Dasdemir, 2016, p. 22). Lastly, the evaluation phase is where the school teacher examines students’ performance and invites them to subject as they work out difficulties as well as persuades students to measure their own understanding as they investigate and use new ideas and competences (Dasdemir, 2016, p. 22). The 5E instructional model is flexible enough that

it can be combined with other instructional techniques to promote significant academic learning. This model was put into effect due to the disappointments in the curriculum and instructional methodologies (Dasdemir, 2016, p. 22) in science courses; thus, the curricula were analyzed which led further into the implementation and educational research of this 5E model. It revealed that learners' speculative accomplishments were amplified, misunderstandings in understanding were recognized and rejected, and also the students demonstrated positive outlooks towards science development when fused with graphics, know-hows, simulations, and engagement to deliver prospects for students' dialogue about the topic, growing their self-poise (Dasdemir, 2016, p. 23) and comprehension skills. The reason various techniques were used in this study was to focus on the matter of personal diversity, because every student has a distinct understanding approach and they understood in their own way (Dasdemir, 2016, p. 23) which resulted in the 5E instructional model being effective with various teaching techniques.

### **Cooperative Environment**

Hence, cooperative learning has several advantages. Altun (2015) listed them as: 1) The Cooperative Environment which indicates that the learning environment provided opportunities to work with other students in class, inspires motivation, requires success, and cooperatively work through collaboration (p. 459). 2) Formation of a realization prospect allows students to use and provide their own knowledge and skills to fairly communicate the subject matter expressively (p. 460). 3) Establishing long-lasting knowledge emphasizes that students learn the subject matter to be capable of elaborating the information back to their peers as part of the learning and teaching process where it is applied successfully to the project (p. 460). 4) Expanding a point of accountability empowers the students to be

individually cautious in what was being constructed in the assignment due to the group's overall success. 5) Displaying various abilities requires individual students to actively provide their cooperation, leadership skills, and knowledge to critically problem solve, manage, and extrinsically motivate the group (p.461). Sousa (as cited in Dat-Tran, 2014, p.133) wrote that that there is holding of 50% of material acquired in the chat group, 75% because of requests for students to study through procedure, and 90% when students demonstrate others. Moore (as cited in Dat-Tran, 2014, p. 133) recounts findings demonstrating that a combination of 'telling' and 'showing' practices results in a better preservation rate of 65%. Therefore, students that are elaborating and teaching the content to others are doing cooperative learning and will retain the information for the long term. As such, "Dewey conceptualizes intelligence as tied to knowledge and integral to morality, as principally cooperative and socially organized, as arising out well-learned habit, as modeled by the scientific method and achievement, and most importantly, as premised by and contributing to democracy" (Tozer et al., 2011, p. 68). In doing so, the diverse learner creates various sets of inhabited encounters and skills in which students can find a voice and sustain their own qualities of their own group and sequential experiences (Hidalgo & Duncan-Adrade, 2009, p. 266).

### **John Dewey**

Moreover, as cited in Simpson and Jackson (2003), John Dewey declared that learning is moving onward from prior knowledge to the newly introduced knowledge into the process of reconstruction which is combined knowledge from their personal learned experiences to support the students as they change from present understandings into new understandings because it includes the student's past, present, and future skills as the student moves towards growth and development as they mature (p. 25). Dewey also proposes that by providing isolated objectives

it is the way instruct and to not step forward in other directions is to restrain the academic development of the students (Simpson & Jackson, 2003, p. 25). Dewey continues asserting that in understanding the whole child as well as our own, it helps us to mentally connect with each other (Simpson & Jackson, 2003, p. 25) while in their learning environment. “If the teacher’s adult mind is poorly developed, she or he will be handicapped in understanding the child’s life and mind and poorly prepared to direct the development of the child” (Simpson & Jackson, 2003, p. 25). Lastly, Dewey adds that the teacher’s understanding allows the learning to generate in the class environments that are desirable to endorse the students’ growth and simplify the development of the student to mature into a knowledge-enhanced and insightful awareness that is favorable to the cultural atmosphere (Simpson & Jackson, 2003, p. 25-26). So, John Dewey (1944) clarifies it further by stating that the subject-matter of science serves to uncover the real child’s knowledge. We do not know the significance of the student’s inclinations or of the student’s accomplishments except as we understand from childhood to other levels of maturity (as cited in Simpson & Jackson, 2003, p. 26).

Additionally, the teacher in this case is perceived as a facilitator or moderator to address students (Simpson & Jackson, 2003, p. 27), the content was presented in class. This approach is crucial because some students have undoubtedly not realized how to work together with others and ought to be instructed to do so and that is part of forming cooperative education (Smith, 1979, p. 25). Since our educational system is rapidly evolving, the demands of covering a vast amount of content in a short period of time can surely be challenging and put tension on encompassing a particular quantity of school material, (p. 25) leaving the students without productivity. According to Smith (1979), “It is precisely the students who take time to learn cooperative skills and who stop to resolve difficulties in working together, who will achieve the most in the long run” (p. 25).

Therefore, the capability of all students to conjoin with other people is the grounding to structure and uphold steady families, occupation accomplishment, locality and civic membership, vital morals and principles, alliances, and contributions to people. Knowledge and abilities are of no use if the student cannot relate them in cooperative contact with other people (Smith, 1979, p. 25). Cooperative learning must be configured in mostly all the academic activities to realize practical learning and competences in a reasonable location of having to perform cooperatively with their fellow students (Smith, 1979, p. 26). Hence, Yoruk (2016) concluded in his study that cooperative learning improves student's perception to their atmosphere and classes, self-usefulness, self-belief and assist students to socialize (p. 1231) developing into rational intellectuals in their society (p. 1235).

According to Xyst (2016), Dewey's outlooks are like constructivism which is a philosophy of understanding that provides an explanation of how an individual comes to realize (p. 11) that entails how realizing appears from a purposeful practice of establishing relationships between activities and outcomes, and the impact of it within the learning environment (p. 16). Dewey deemed that associations between responsibility, results, and impacts make up the fundamental nature of beliefs and that the comprehension neither implies the result of thinking nor the result of probing the link between conflict and outcome (Xyst, 2016, p. 16). As cited in Xyst (2016), Dewey stated:

While all thinking results in knowledge, ultimately the value of knowledge is subordinate to its use in thinking. For we live not in a settled and finished world, but in one which is going on, and where our main task is prospective, and where retrospect-and all knowledge as distinct from thought is retrospect- is of value in the solidity, security, and fertility it affords our dealings with the future (Dewey, 1944, p. 151).

Basically, Dewey asserts that to produce comprehension is to make meaningful associations that can further be analyzed and later applied to configure its results. Its results will then provide the knowledge for further investigation, discovery, and trialing that Dewey depicted reasoning and implication as an infiltration of the new (Xyst, 2016, p. 16).

According to Barbieru (2016), John Dewey accentuates on how children learn in an active student-centered environment. Knowledge through familiarity has a superior impact than knowledge through only the use of recollection (Barbieru, 2016, p. 71). Since experience is an understanding, it is the result of an active environment. It is crucial for the practice to awaken the student's interest, to promote the will to act and to resolve extreme targets that go ahead to knowledge (Barbieru, 2016, p. 72). Once the groundwork of knowledge has been established, the child will then be able to envision using his actual environment for representational activities (p. 72). Dewey (1935) stated that it is to accentuate the circumstance that students in traditional institutes do have practices and, that the distress is not the lack of understandings, but their substandard atmosphere (p. 10). The child must self-learn not imitate while the adult serves as the facilitator in relation to progressive education. The teacher can uncover the creations of the student but only through a close examination of the interests of the student (Barbieru, 2016, p. 72).

A main concern of teachers is that they not only be mindful of the overall belief of the determining of authentic knowledge by surrounding circumstances, but that they also distinguish in the tangible what environments are advantageous to having involvements that lead to progress (Dewey, 1935, p. 15). Interest can have an advantage to internal mastery of the student. If a student discovers an interest in an activity, the student develops exploring that activity and, thus, he focuses (72). To conclude, interest and self-restraint are put together when importance is placed on the project (p. 73). A situation is then created when

collaboration occurs. It designates comparable merits to both circumstances in practice-unbiased and inner situations (Dewey, 1935, p. 17). Thus, the learning is continual while the interactions are in motion influencing other experiences and interactions. These two principles go hand in hand to create an educative experience significantly. Dewey (1935) mentions that the experience for continuing education is that it involves more importance than was present upon previous visionaries, a viewpoint in education is based on a viewpoint of knowledge (p. 11). John Dewey (1935) states

If one attempts to formulate the philosophy of education implicit in the practices of the new education, we may, I think, discover certain common principles amid the variety of progressive schools now existing. To imposition from above is opposed expression and cultivation of individuality; to external discipline is opposed free activity; to learning from texts and teachers, learning through experience; to acquisition of isolated skills and techniques by drill, is opposed acquisition of them as means of attaining ends which make direct vital appeal; to preparation for a more or less remote future is opposed making the most of the opportunities of present life; to static aims and materials is opposed acquaintance with a changing world (Dewey, 1935, p. 7).

### **Jean Piaget and Lev Vygotsky**

Subsequently, Piaget, Vygotsky, and Dewey (as cited in Dat-Tran, 2013, p. 106-107) share their views on the cognitive theory which stress that individuals develop, learn, assimilate, and accommodate due each other's knowledge and skills taking place during the cooperative learning activities among the groups social interactions generating active learning. Piaget's developmental theory highlights the contribution and involvement of students in the acquiring and imagining development. In the acquiring practice, student's paradigm and rebuild learning

by themselves (Dat-Tran, 2013, p. 106). Slavin (as cited in Dat-Tran, 2013, p. 106) states that Vygotsky's view of cooperative behaviors among students is that it progresses development because children are in a consistent age in one another's ZPD and template performances, which is more valuable than students succeeding independently. In short, Vygotsky focuses on social interaction while Piaget focuses on cognitive development, yet they both intertwine cohesively.

Sequentially, Erdogan (2016) also states that Vygotsky's sociocultural learning theory supporters and encourages that instruction and learning science ought to not be detached from the culture and philosophy in which it is positioned by collectively scholarly backgrounds of useful systematic dissertations and depictions are main to knowledge and doing science (p. 246). Vygotsky, in social constructivist theory, inserted that student's intellectual occurrence is affected most by communication with individuals, especially close relatives, other children, educators, and tutors in the student's social setting (Kivunja, 2014, p. 84).

### **Albert Bandura**

Albert Bandura's social learning theory (as cited in Dat-Tran, 2013, p. 107) indicates that individuals learn also by observing and reciprocating the behaviors of others in their own social environment causing retention of the skills being taught. Bandura proposes that social learning theory is descended from a sequence of environmental and emotional dynamics, including preservation, the competence to replicate performance, and the enthusiasm to embrace performance (Tozer et al., 2011, p. 469). Schunk (as cited in Dat-Tran, 2013, p. 108) demonstrated that the social learning theory of students can enhance their understanding and preservation by monitoring and demonstrating the chosen performances, viewpoints and responses of others, and that individual thinking developments are vital to behavior. Still, Bandura's social learning theory proposes that social interests are around such as education,

agencies, clinics, internet gateways, or other groups (Erdogan, 2016, p. 247). Schools are one of the worthiest social settings in which many inhabitants learn conduct. Students learn actions by monitoring others. Students are more likely to simulate watched performance if they also observe desired results and take supporting response from teachers and parents (Tozer et al., 2011, p. 469).

## **Constructivism**

### **Psychological Constructivism**

Constructivism is a denotation production theory that explains the disposition of knowledge and how individuals work (Abdal-Haqq, 1998, p. 1). It states that people learn, create, and construct wisdom utilizing what they already know and integrate it with new knowledge to form new perspectives, ideas, and experiences. The teacher is simply the facilitator who encourages students to examine, question, and communicate their own ideas, thoughts, and inferences (Abdal-Haqq, 1998, p. 2). Piaget's psychological constructivism upholds the learner's pursuits and wants, which is a learner centered methodology that articulates students' wisdom and experiences that are modified by the teacher who accelerates and delivers tasks that offer predicaments for students. Therefore, knowledge is magnified when learners work through these tasks or predicaments (Abdal-Haqq, 1998, p. 3). Instructional practices include discovery education and hands-on activities, such as by means of manipulatives. Student assignments that test prevailing ideas and reasoning methods. Probe techniques that inquire students' views and persuade investigation of those beliefs (Abdal-Haqq, 1998, p. 3).

**Constructivist Approach.** John Dewey's constructivist learning theory (as cited in Dat-Tran, 2013, p. 109), which indicates that learning takes place through social interactions creating new knowledge from previous knowledge learned to simply reconstruct new ideas in their social environment.

Thus, students in cooperative learning groups are projected to realize more when they are in self-control of assembling their own understanding through mutual collaboration with their team (Dat-Tran, 2013, p. 110). Currently, the constructivist approach has been taken by some teachers to supply students with the knowledge and dexterity to successfully meet their individual necessities in the classroom regarding science (Toklucu & Tay, 2016, p. 316). According to Toklucu and Tay (2016), "constructivism is based on the idea that people learn better when they actively construct knowledge and associate new knowledge with previous knowledge" (p. 316). Toklucu and Tay (2016) affirm that students taught with constructivist strategies uncover their wisdom that they can efficiently utilize in various situations where it can be constructed and applied to form their individuality and add to their views and experiences (p. 316). Grennon Brooks and Brooks (as cited in Toklucu & Tay, 2016), recognize the five principles of constructivism. The constructivist teacher pursues a student's perspectives. Constructive lessons challenge the students' expectations and need to make supplements involving the core curriculum that does not assess the students' learning independently but contained by the framework of everyday classrooms (p. 316-317). In turn, students can individually create sense based on their prior knowledge by social interaction in authentic tasks (Toklucu & Tay, 2016, p. 317). Combined with constructivism, cooperative learning is the most productive of every part of preparation, exploration, and principles in learning and teaching (Toklucu & Tay, 2016, p. 317). Johnson and Johnson (as cited in Toklucu & Tay, 2017) assert that cooperative learning is an adaptable method and can be

purposeful (p. 317). Students work cooperatively to admit and comprehend the newly acquired knowledge for the completion of a certain task to boost learning to effectively contribute to the focused objective (p. 317). The results of the study by Toklucu and Tay (2016) indicated that systemic teaching and constructivist learning approaches combined with cooperative learning had a significant positive effect on student success; it also advocated that cooperative learning and constructivist learning amplified student scholarship accomplishments (p. 326). They increased students' accomplishments without any dependency on each other (Toklucu & Tay, 2016, p. 326).

However, according to Dagar and Yadav (2016), students are crucial spectators of their individual circumstances and need partakers in discussion and challenges related to their schooling and outlook prospects (p. 1). Thus, instruction involves the course of the progress and knowledge of the student on various aspects, enabled by the teacher, who is conducted by the program of study (Dagar & Yadav, 2016, p. 1). It is teaching that engages the students in the actual situation. It motivates and empowers learners by giving them some control and direction over the learning process and activities. It is the teaching that supports collaboration and cooperation among learners, recognizing the classroom as a community where every person shares knowledge and skills. It encourages students' thinking about what they are learning and how they are learning it (Matriano, 2020, p. 215).

**Constructivist Theory.** Bruner's constructivist theory is that learners build new visions and beliefs by understanding them through similarity with previous information. "This implies the learning is not about simply being exposed to new information but is an active process whereby learners examine, code, decode, and interpret new concepts and ideas" (Pagan, p. 1). Simply put, Bruner highlights that individuals construe their connections and

distinctions between experiences to enhance their interpretations. The intellectual developments behind this understanding appeal to motivation from cultural and communal views of students' lives, execution of rewards and retributions, and students' enthusiasm to learn (Pagan, p. 1). The socio-cultural upbringing determines what sorts of knowledge that learner will construct, as well as shape the mental developments that individual uses to create and utilize representations. Bruner owes much of his ideas to Jean Piaget who inspired learners to think about the difficulty he presented to them. "All cultures develop habits, traditions, and activities adapted to their specific needs. These needs stem from the environment and many other factors, and the culture's cognitive development and learning, as well as the relative strengths and weaknesses pertinent to creating and adapted specifically to help meet these needs" (Pagan, p. 1).

**Constructivist Pedagogy.** Pedagogy is used as a transport to motivate the learner to develop their self-sufficiency, emotional intelligence, and individuality. Dagar and Yadar (2016) stated that constructive instruction is one such method where activities are projected to students that are significant to them and the learner exhibits, explorations, uses the capability for taking creativities and for being imaginative. Within constructive instruction, students are provided chances to create their own knowledge based on an interface concerning what they previously know (p. 1). Constructivism describes the entanglement of the education learning method (p.2). The researchers asserted that we must acknowledge that there is no such thing as familiarity, autonomous of the apprehender but only awareness we assemble for ourselves as we discover is the authentic knowledge (p. 2).

## **Social Constructivism**

Constructivism is mainly about the understanding and the development of knowledge. Jean Piaget's view is constructivist. Piaget believed that learning attainment is a development of constant self-creation (Dagar & Yadav, 2016, p. 2). People obtain wisdom through the activities they perform and the steps they take to gain wisdom. Case in point, "The father of social constructivism, Vygotsky views the origin of knowledge construction as being the social intersection of people, interactions that involve sharing, comparing, and debating among learners and mentors" (Dagar & Yadav, 2016, p. 2). Through interaction, people polish their wisdom and aide in meaningful learning for others. They both gain wisdom simultaneously. Vygotsky centered on social interactions, society, and dialect when it came to knowledge development. Teachers should motivate learners to uncover the standards of the lesson themselves, mainly by participating in active discussion with the teacher and other learners. Such practice helps since "active dialogues are a part of Socratic learning, based on Socrates' premise that discussion engages a student's mind more than listening to lectures" (Pagan, p. 1).

Thus, constructivism highlights the student centered, student focused and cooperative approach of instruction learning development in which learning is reinforced by teacher support and real assignments (Dagar & Yadav, 2016, p. 2). Constructivism's theoretical view of knowledge is that it is acquired by creating knowledge that is not provided by others, by utilizing prior knowledge to create new learning, by socializing with others, and by using real situations (Dagar & Yadav, 2016, p. 3). Consequently, constructivism's learning process needs powerful and well-informed educators that can transport and put into motion constructivist theory. Consequently, in a social constructivist learning environment, teachers

take on the tasks aiding students to obtain and progress highest abilities like investigation, challenge resolution (Bay, 2012, p. 344).

The Vygotskian social constructivism accentuates learning for shared renovation and exhibits a philosophy of individual improvement that puts the individual within a sociocultural framework (Abdal-Haqq, 1998, p. p. 3). In 2012, Erdal Bay conducted a study, *The Effects of Social Constructivist Approach on the Learners' Problem Solving and Metacognitive Levels*, in Turkey to investigate the difference in the learners' problem-solving skills and metacognitive levels when applying social constructivist tasks on the experimental group and on the controlled group traditional tasks. In the study, 89 teachers were included in the experimental group along with 48 teachers in the controlled group. For the pretest and posttest, "Problem Solving Scale" created by Heppner and Peterson and "Metacognitive awareness Scale" were administered to teachers to determine the problem-solving skills and metacognitive levels. After using the ANOVA technique, the results demonstrated that they were statistically significant in the experimental group than the control group. It was concluded that the problem-solving and the metacognitive skills taught with the social constructivist approach were more effective in the experimental group than that of the traditionally taught control group. Of significance, this finding suggests that in teaching problem resolution and metacognitive cognizance assistances, which are basic aids every person should possess, dependable task-constructed social constructivist instruction settings become operative (Bay, 2012, p. 347).

### **Constructivist Classroom Environment**

The classroom environment is a learning culture that is coupled with the social constructivist educational theory. A constructivist classroom is characterized by the time spent

on student centered behaviors and it should be directed by the cooperative learning method (Dagar & Yadav, 2016, p. 4). When they perform collaboratively on real duties, individuals can increase their perspective, deal with a challenge by considering it from numerous perspectives and construct significances or results relate to the collective implications (Bay, 2012, p. 344).

Further the pedagogical goals determined to construct a constructivist learning environment are as follows:

- Provide learning experience with the knowledge construction process.
- Provide learning experience in and appreciation for multiple perspectives.
- Embed learning in realistic and relevant contexts.
- Encourage ownership and voice in the learning process.
- Embed learning in social experience.
- Encourage the use of multiple modes of representation.
- Encourage self-awareness of the knowledge construction process (Dagar & Yadav, 2016, p. 4).

Bay (2012) asserted that Azzarito and Ennis (2003) mentioned in their research that in reference to social constructivist, knowledge happens by means of student collaboration, student proprietorship of the curriculum and instructive skills that are reliable to the students (p. 343). Bay (2012) also mentioned that Brophy and Alleman (1991) depicted authentic tasks as students are probable to do to learn, apply, assess, or in any other way to curricular matter (p. 344). With this depiction, learners understand how to solve similar problems in the outside world where they take initiative of their own learning. Constructivism as a philosophy, as a viewpoint, and as a method to teaching suggests that the students are builders of their own awareness which is produced by networking with their atmosphere as regarded by Vygotsky

in 1978 (Matriano, 2020, p. 216). Matriano (2020) asserted that effective collaboration among the students themselves and among the students and the teacher as well as with individuals with substantially supported to increase understanding of significance knowledge (p. 222). This permits learners to uncover, investigate, and apply skills and tactics in schooling. The education must be individually significant and important to the learner. Learning is heightened when students are contributed the chance to gather of their individual noticed reassurance to sensible and collective setting and being liable for one's conduct and possessing the outcomes (Matriano, 2020, p. 222).

### **Cooperative Learning Cases**

#### **Deconstructive Cases**

In contrast, cooperative learning also has had supplementary educational challenges that have augmented the social relevance of cooperative knowledge (Chen & Liu, 2017, p. 78). According to Chen and Liu (2017), passive learners might discover it difficult to become effective and autonomous in their learning especially if they are managed to take note (p. 78) like in most traditional educational settings. Emotional influences out of deficiency of involvement in class are fostering ineffective group work (Chen & Liu, 2017, p. 78).

Still, educators find it tough to change from teacher to a facilitator. Some teachers could not finish cooperative responsibilities appropriately for motives such as time restrictions, uncertainties about the efficacy of cooperative method in a viable setting and students' capability to learn by themselves, and their complete reluctance (Chen & Liu, 2017, p. 78). Thus, new pedagogies are seen with opposition. As seen here, not only math but science mostly requires a lot of manifestation and believing on the students (Chen & Liu, 2017, p. 83). Therefore, it's essential to make additional inquiries (Chen & Liu, 2017, p. 84).

Kocabas and Erbil (2017) contributed that some research results showed that the circumstances of cooperative learning are not contented and therefore it is not employed proficiently and, the focal problem related to application is that the teachers express and consider the employment progression of the method as difficult but, they cannot mirror the research related to the class environment (p. 317). Consequently, it has been highlighted in the literature that the information of teachers how to implement cooperative learning to class setting and preparation program is relatively significant for communication development and necessity of teacher-student, and to sustenance the cooperative investigation and aptitude for problem solving, and to empower the students in the class environment (Kocabas & Erbil, 2017, p. 317). The authors also mentioned Akay and Kocabas (2013) study, which states “the problems related with the implementation of active learning methods were caused generally by curriculum, school management, parents and students” (p. 317). Kocabas’s and Erbil’s research measured the expertise of engaged teachers about the cooperative learning method which depends on present preparation that includes a student-centered teaching (p. 318). Thus, “cooperative learning leads student centered, active and democratic learning method” (Kocabas & Erbil, 2017, p. 318). According to the authors, in a 2015 study by Kocabas et al., it was concluded that cooperative learning influenced several variables clearly by 80% (Kocabas & Erbil, 2017, p. 317).

**Case 1.** According to Baloch and Brody (2017), in 1949, Morton Deutsch held a study on the outcomes of peer cooperation and competition. “The findings from this study challenged the widely accepted belief that students who compete work better than students who cooperate to facilitate their own and each other’s learning” (Baloch & Brody, 2017, p. 274). Accordingly, Deutsch initiated and authenticated the social interdependence theory. Its

predecessor, John Dewey, focuses on such a theory about social construction as early as 1916 (Baloche & Brody, 2017, p. 274).

Baloche and Brody (2017) write that David and Roger Johnson added to the application and research of the social interdependence theory in the cooperative learning pedagogy. Since they created the five components of cooperative learning, they accentuate the significance of teacher instruction. (p. 276). Thus, variations in the schools and classrooms have received consideration in deliberations about aptitude grouping and in research that highlights success variances between all students and amongst cultural groups and social classes (Baloche & Brody, 2017, p. 276). This variance in turn may result in a dilemma of the subgroups when asked to cooperate that are linked to the differences of the campus and its population ((Baloche & Brody, 2017, p. 276). Therefore, cooperative learning implementation has been a challenge to put into practice. By placing students into groups, it does not guarantee quality cooperation or even that of student learning. Baloche & Brody (2017) affirm that determining positive social interdependence, composing a mutual goal and supplying instruction in how to succeed simultaneously are unlikely to be sufficient (p. 276). So, for cooperative learning to be successful, “teacher-education programs and faculty-development efforts must, at minimum, (a) recognize teachers’ concerns and questions and honor the contexts for these concerns; (b) provide relevant learning about theories, models and strategies; (c) model effective cooperative learning; and (d) ensure opportunities for teacher problem solving and practice” (Baloche & Brody, 2017, p. 277). The essential attributes of cooperative learning though supply learning challenges as well as its implementation. These comprises that cooperative learning manages to decrease resistors and probability, necessitate consideration to societal aims and the growth of considerate groups, change prominence away from the activities of the individual, challenge the worth often accredited to opposition

(Baloche & Brody, 2017, p. 277). They mention that teacher's perspectives and principles are crucial to the implementation of cooperative learning effectively. On the contrary, the challenges and progress of cooperative learning lie in pre- and in-service education. In a report of 200 teachers, challenges for cooperative learning implementation: reports from elementary school teachers in Switzerland was scrutinized by Celine Buchs, Flippou, Pulfrey., and Volpe in 2017.

According to Baloche and Brody (2017), the findings imply that cooperative learning was not extensively utilized and that the perspectives of the teachers, teamed with the burdens of time and curriculum, were significant contributing factors of practice. The authors indicated that the organizational encounters, including that of the two days of professional development the teachers acknowledged did not stipulate prospects for teachers to plan and reproduce, and there were no dependable structures in place for teachers to work in school groups and be maintained by overseers (p. 278). The authors continue by stating that they categorize an administration agenda of essential content that references only content exact educational methods and lives teacher training programs slight periods to discover cooperative learning, and deficient of proficient use of cooperative learning by numerous teachers with whom student-teachers work during their practicums (Baloche & Brody, 2017, p. 278). Now, during the interviews, student teachers felt optimistic about implementing cooperative learning. On the other hand, these pre-service teachers felt the strain of time and the school's program of study once they were in their own classrooms (Baloche & Brody, 2017, p. 277). The authors imply that the superiority of early studies, trialing and teamwork for cooperative learning may affect subsequent use (Baloche & Brody, 2017, p. 278).

Due to time constraints on teacher preparation programs in universities, faculty is also faced with challenges too on picking and teaching the fundamentals and its pedagogies as well

as the finest utilization of educational performances in the classroom. In the study, *The Plot Thickens Supporting Pre-Service Teachers in Authentic Use of Cooperative Learning through the Story Path Instructional Approach*, Laurie Stevahn and Margit McGuire explain how the theory and practice of cooperative learning was implemented to a master's level cohort for a year (Baloche & Brody, 2017, p. 278). Stevahn and McGuire goal is to address the problems of cooperative learning.

Defined by Stevahn and McGuire, the combined program method benefits to talk and discuss curricular interrogations because college faculty impart teachings to students in reliable school surroundings, therefore, the program can stipulate actual model for mutually preservice and school teachers. An additional feature of the program that has acknowledged tasks in a groundbreaking way is by development in college-based work after the student education practicums; this inspires representation, merging of education, and objectives (Baloche & Brody, 2017, p. 279).

Baloche & Brody (2017) suggest that by supplying teachers with the tools, answers, and clarifications sustain a strong scholarship for them (p. 281). As an alternative, they stress examining perspectives, classifying difficulties, employing exploration as groundwork for origination, considering framework and rational increments, constructing societies for investigation, trialing, and sustenance, being ready to flop, distinguishing when something does not function (Baloche & Brody, 2017, p. 281). Since these are some deep challenges, they may not always be easy to implement or learn. They advocate that to show actual learning and variation that can progress the life probabilities of students, teachers, administrators, and parents. The students themselves need encouragement to obtain and encounter task work that is taken by investigation and is concentrated by obligation to cooperation and fairness (Baloche & Brody, 2017, p. 281).

**Case 2.** The basic principle of student learning is exposing them to various learning opportunities combined with essential pedagogy. Since cooperative learning is well recognized for its efficient benefits like communal enrichment, cognitive effects, and enthusiasm, it still has challenges in implementation due to the engagement and instructional methods needed (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 296). The study purposes are to verify these tasks at the elementary school, investigating teachers' perspectives concerning knowledge as well as the obstacles teacher's testimony when executing cooperative learning (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 296). Its mission is to assemble and encourage constructive interactions within the groups to stimulate positive interdependence among students; and to facilitate student interactions during their groups to stimulate individual responsibility and joint accountability when students contribute to their learning (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 297). Three key points may help prepare students. First, a constructive environment for learning with other students to inspire cooperative ideals and models to focus on students' goals. Second, precise work on cooperative skills develop the abilities required for students to engage collaboratively. Third, grouping provides feedback on how to improve the way students work simultaneously (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 297). According to Buchs, Flippou, Pulfrey, and Volpe (2017), even though there is an abundance amount of literature supporting cooperative learning, teacher instruction mostly does not include student persuasion; For instance, in the United States, in elementary classrooms emphasized that students spent in excess of 91% of their period in whole-group or specific seatwork and only 7% of the time is dedicated to small-groups (p. 297). The researchers also unearthed that in the United Kingdom students occupy 64% of their time in individualized work, 20% in cooperative dialogue and are contributing for less than 12% of their time in peer collaboration (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 297).

Consequently, in Buchs, Flippou, Pulfrey, and Volpe (2017) study, *Challenges for Cooperative Learning Implementation: Reports from Elementary School Teachers*, this study examined the relation between teachers' perspectives concerning learning and academic approaches, and the interrogated possible complications teachers practice when implement cooperative learning (p. 297). Teacher beliefs are essential to cooperative learning since teacher-centered beliefs determine how the content is transferred from teacher to student. As such, the learner-orientation beliefs, which is the social constructivist approach, places the liability of learning on the student (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 297).

According to Buchs, Flippou, Pulfrey, and Volpe (2017), six challenges have been uncovered: The first challenge is difficulty in properly implementing cooperative learning principles because it takes preparation and controlled grouping. The second challenge is locus of responsibility and authority where the entrustment is passed on to the student and their individual learning. The third challenge is the teacher's role as a facilitator where the teacher assists, guides, and directs/redirects student learning only. The fourth challenge is alignment with curriculum, specifically incorporating and aligning cooperative learning strategies with the core curriculum. The fifth challenge is class and preparation time with teachers reporting difficulties on in class time management and planning and organizing time investment. The sixth challenge is assessment in cooperative learning where assessment may be professed as thought-provoking for two reasons: teachers have to make choices regarding the assessment of academic and cooperative learning, and also choose the interdependence in the assessment (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 298-299).

The results indicate that teachers found cooperative learning as a challenge to implement. Buchs, Flippou, Pulfrey, and Volpe (2017) report that beyond 40% of the respondents present it sporadically and only one-third use it consistently (p. 303). It was found

that teacher-centered beliefs had no significant relation with learner-orientation beliefs, but teachers suggest that a teacher transmission environment derives from the teacher beliefs which doesn't mean that they don't implement cooperative learning (p. 303). As in various situations, teachers are professed as professionals who convey while students obtain awareness, teachers' perspectives may assist us to comprehend why old-style approaches remain the pillar of classroom settings (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 303-304). Buchs, Flippou, Pulfrey, and Volpe (2017) affirm that in totality, this survey concerning trials for cooperative learning implementation pointed to the importance of educational principles and logical complications like time and the program of study (p. 304). This study recommends that staff developers concentrate on these challenges due its findings of 32% of cooperative learning implementation by teachers in a classroom setting (Buchs, Flippou, Pulfrey, & Volpe, 2017, p. 304).

**Case 3.** According to Gillies and Boyle (2010), cooperative learning has numerous positives outcomes. It is a pedagogical approach that cross-examines issues in a social context and scholastically, with combined experiences such as discussions, engagements, opportunities, new experiences, motivation, and verbally (p. 933). The researchers propose that there are issues with cooperative learning execution. They write that students are unreceptive receivers when not permitted to interact in a teacher centered setting where students are limited to their expectations knowing that the teachers have the capability to boost questioning learning (p. 933).

“Unfortunately, students are often placed in classroom situations where they have little opportunities to reap the benefits from interacting with others” (Gillies & Boyle, 2010, p. 933). They were also placed in large groups where there was little control and the teacher was

not able to facilitate resulting in decreased instruction as well as initiating few cooperative lessons (Gillies & Boyle, 2010, p. 933-934).

Gillies & Boyle (2010) write that teachers face challenges when they are reluctant to release the control and accountability over to the students due to not having the full understanding or preparation in cooperative learning (p. 394). Therefore, it is imperative that teachers comprehend how to insert cooperative learning into the classroom courses to foster engagement between teachers and students, encourage cooperative learning enquiry, problem-solving, and stipulate students with an atmosphere where they feel maintained and expressively sheltered (Gillies & Boyle, 2010, p. 934). In turn, students also need to be trained how to interact and work together to successfully complete the assigned task in a well-prepared classroom environment where the teacher facilitates and guides the students into a rigorous learning outcome (Gillies & Boyle, 2010, p. 934).

In the study, *Teachers' Reflection on Cooperative Learning: Issues of Implementation*, Gillies and Boyle (2010) expose teacher perceptions on cooperative learning and what were the challenges they experienced. After analyzing the results, the researchers coded the interviews into themes: the first one was implementation where teachers feel that cooperative learning produces positive results. However, they did find difficulty in time management, preparation, organization, student adjustment, and class control (p. 934-935).

Positive interdependence is a key component to successfully achieve accountability and individual learning to attain efficient results (Gillies & Boyle, 2010, p. 935). The second theme is group composition where teachers used various ways to group students like in pairs, groups of three or four, mixed, with friends, and same gender. The researchers' results suggest that mixed groups had no difference while those groups that were formulated with their helpers had inaccuracies in their outcomes, but it also produced effective cooperation and

collaboration among them ending in a positive result while ability grouping enable inactivity among them (Gillies & Boyle, 2010, p. 935-936). The third theme is task construction where students are motivated to work with each other when they are involved in choices, work autonomously, and engage in their interests (Gillies & Boyle, 2010, p. 936). But, when students are required to work on duties that establish processes monitoring, student connections are insignificant as they more easily present solutions, exchange communication, or provide support. In contrast, when students work on missions that are released and encounter with no exact solutions, they learn that they must disclose knowledge and data (Gillies & Boyle, 2010, p. 936). The fourth theme is student preparation where students need to be educated and/or equipped to work in groups as part of their interpersonal skills, and instructing students the social and small-group skills that enable cooperation in groups is serious to the achievement of them (Gillies & Boyle, 2010, p. 936). Remarkably, all teachers granted that organization needed to take place if students were to work effectively in groups, which involved educating students in the social abilities and managing disputes (Gillies & Boyle, 2010, p. 938). Nevertheless, teachers still need to devote time to enforce and reinforce these skills. The last theme is assessment where teachers determine how students will be evaluated when incorporating cooperative learning in the lesson. The teachers' methodologies to evaluating group learning various extensively with some teachers recognizing that they were facing obstacles (Gillies & Boyle, 2010, p. 937). In brief, while many teachers may express apprehensions about the complications involved in emerging and employing valuation duties that are reliable, they indicate the benefit for students to progress on both developmental and cumulative valuation responsibilities (Gillies & Boyle, 2010, p. 937). In conclusion, the results show that teachers found cooperative learning as a challenge to implement. Buchs, Flippou, Pulfrey, and Volpe (2017) reported that more than 40% if the

teachers introduce it intermittently and only one-third use it regularly (p. 303). It was found that teacher-centered beliefs had no significant relation with learner orientation beliefs, but teachers suggest that a teacher transmission environment derives from the teacher beliefs, which does not mean that they do not implement cooperative learning (p. 303). Teachers are identified as specialists who impact student's learning. As such, teachers' perspectives inform us to identify why conventional tactics remain the basis of classroom activity (Buchs, Flippou, Pulfrey., & Volpe, 2017, p. 303-304). This survey concerns encounters for cooperative learning implementation aimed to the magnitude of instructional beliefs and reasonable obstructions (p. 304). This study recommends that staff developers concentrate on these challenges due its findings of 32% of cooperative learning implementation by teachers in a classroom setting (p. 304).

**Case 4.** According to Ghaith (2018), cooperative learning is maintained by several theoretic backgrounds such as the motivational, intellectual progress, communal reasoning, social interdependence, and the communication as well as the social constructivist concepts of education and knowledge (p. 2). Cooperative learning is also declared as an instructional background in the setting of instructive transformations and streamlining instructive classifications in many realms throughout the world, given that it reports widespread curriculum, intellectual and communal aims (Ghaith, 2018, p. 2). Ghaith (2018) wrote that authentic importance is placed on cooperative learning and its established academic pedagogy which allows exertion in controlled groups to stem into various teaching schemes (p. 3). So, current teaching and learning lessons can be reformed into conceptual cooperative lessons.

Ghaith (2018) also mentions that Kagan (The Structural Approach) in 1985, Slavin (Student Teams Achievement Divisions) in 1995, (Jigsaw) in 1986 and 1995, and Aronson, et al (Original Jigsaw) in 1978, all used concrete methods to implement cooperative learning in

heterogeneous groups while Johnson and Johnson (Creative Controversy) in 1995 and (Learning Together) in 1999 and Sharan and Sharan (Group Investigations) in 1992, all use conceptual student-centered methods to implement cooperative learning in heterogeneous small groups (p. 4). Consequently, all methods vary notably which may result in complexity of implementation.

Ghaith's (2018) mixed-methods study includes a cluster random sample of 18 EFL teachers from the Republic of Lebanon. The results indicate that Original Jigsaw, Jigsaw II, and Think-Pair-Share were harmonious with the participants practice while Student Teams Achievement Divisions was not supportive and Learning Together required resources not sustained by school guidelines. Among the participants, cooperative learning is appreciated as an essential instruction for getting outgoing capability and collective organization (p. 17).

Student Teams Achievement Divisions were not as aligned due to curriculum. As a result, "this underscores the role of the curriculum and its desired learning outcomes as important factors in the perception and applications of cooperative learning as a proven student-centered pedagogy" (Ghaith, 2018, p. 17). Creative Controversy is considered the most significant due to promoting communication stemming into Think-Pair-Share, Learning Together, Jigsaw, and Group Investigation providing equivalent prospects in an autonomous atmosphere (Ghaith, 2018, p. 17). Lastly, the cost and challenges of cooperative learning are controlled by the cooperative learning attributes. It was found that Think-Pair-Share and Jigsaw to be low in cost and complex to apply, in contrast to Student Teams Achievement Divisions and Learning Together. As for the cooperative instruction educational characteristics, the partakers commended team opposition in Student Teams Achievement Divisions, skilled dialogue in Jigsaw II, positive interdependence in Learning Together, distinct responsibility and performance in Group Investigation (p. 18). This study focuses on

the significance of putting the content and practices parallel to curriculum and its aims. It is suggested that organizers of in-service professional development programs classify and concentrate on the cooperative learning approaches that aid the curriculum objectives to be beset by the program partakers, to protect properties and safeguard better probabilities of cooperative learning application. This is specifically critical in the framework of domestic amendments and skilled advancement programs, in scholastic circumstances depicted by constrained substantial and individual means (Ghaith, 2018, p. 18).

### **Constructive Cases**

Cooperative learning also has its compensation. Altun (2015) listed them as: 1) Cooperative surroundings establishment which reveals that the learning setting supported occasions to work with other students in class, encourages inspiration, demand triumph, and jointly work through association (p. 459). 2) Triumphant creation prospect which allowed students to use and provide their own knowledge and skills to fairly communicate the subject matter expressively (p. 460). 3) Enduring learning care which emphasized that students learn the subject matter to be capable of elaborating the information back to their peers as part of the learning and teaching process where it is applied successfully to the project (p. 460). 4) Acquiring accountability which empowered the students to be individually cautious in what was being constructed in the assignment due to the group's overall success. 5) Exhibiting various proficiencies which required individual students to actively provide their cooperation, leadership skills, and knowledge to critically problem solve, manage, and extrinsically motivate the group (p.461). Sousa (as cited in Dat-Tran, 2014, p.133) wrote that that "there is retention of 50% of material learned in the discussion group, 75% as a result of requests for students to study through practice, and 90% when students teach others." Moore (as cited in

Dat-Tran, 2014, p. 133) informs findings showing that a combination of revealing and displaying techniques results in greater retention (65%) after three days.” Therefore, students that are elaborating and teaching the content to others are doing cooperative learning and will retain the information for the long term. Additionally, Kagan and Kagan (as cited in Tamah, 2014, p. 200) asserted that individualistic responsibility is creating each student in the group is held responsible for the individuals own learning. Thus, in doing so, it prevents others from taking credit from others other than for themselves. “Each student must be seen as completely self-sufficient on one alternative to enable him or her to take personal responsibility for working to achieve group goals” (Tamah, 2014, p. 204).

Consequently, “An important goal of science education is to help students develop an understanding of concepts and use them when solving a problem in a new situation” (Celikten et al, 2012, p. 85). In addition, the objective of science instruction is to set up a scientifically educated resident who can explain the regular challenges about science (Tatar & Oktay, 2008, p.67). Nesbit and Rogers (as cited in Tatar & Oktay, 2008, p. 67-68) asserts that cooperative learning is a notably valuable approach used in resolving these obstructions since it supports individuals to justify different matters of sights. Slavin (as cited in Parveen & Batool, 2012, p. 154) emphasizes that cooperative learning activities are precisely constituted educational activities in which students are held liable for their subsidy, contribution, and knowledge. Parveen & Batool (2012) also affirms that cooperative learning is an instructional approach in students joining in activities that foster association and fellowship (p. 154).

**Case 1.** According to Gisbert, Seuba, and Coll (2017), the educational significance of cooperative learning can be supported by its key aptitudes for the teaching and learning culture due to its growth towards abilities and outlooks for the autonomous class structure of social interactions that brings about the zone of proximal development; thus, allowing the

luxury of inclusivity to be used as its educational foundation (p. 280). “CL is an essential tool to meet the challenges of the 21st century: global interdependency, democratization, entrepreneurship, and interpersonal relationships” (p. 280).

Although, cooperative learning has been comprehensively studied, it also comes with concerns about its implementation and how it can prevail. In doing so, Gisbert, Seuba, and Coll (2017) suggest that teachers need to be trained in the theoretical groundwork of cooperative learning, need to be demonstrated and provided various schemes and performances, exposed to group relations, and renovate their role as teachers (p. 280). Concerning teacher training, it has been proposed that the reason it has its complexity is because of the scarce understanding and awareness of the cooperative learning method. Currently, programs are being developed at universities derived on cooperative learning models to allow students the flexibility to augment the conceptual transformation through cooperative learning; in turn, students are going through initial training to see, use, and apply it in authentic class settings (Gisbert, Seuba, & Coll, 2017, p. 281). But, the true challenge remains and that is overcoming the previous role of instruction.

While utilizing cooperative learning, teachers are not a spreader of information, but instead facilitator to structure circumstances that promise suitable interdependence and collaboration among students, as well as endorse and industrious and productive ways of connecting, discussion, and message, relocating regulator as well as the focal part in the action (p. 281). This requires the teacher to expand on precise abilities before in the proposed period, during student relations period, and afterwards thoughtful period in the events. In this admiration, contribution conditions were forthcoming teachers can not only understand, organized with their college instructor, how to progress their position, but also practice it, may be an influential way of cultivating opportunities during cooperative learning (Gisbert, Seuba,

& Coll, 2017, p. 281). Thus, the more known and knowledgeable teachers are about cooperative learning the more positive and straightforward their approach toward its implementation. The key aspect is their perspectives about CL and its efficiency.

In doing so, the “Cooperative Learning Implementation Questionnaire (CLIQ)” was initiated to uncover the basis why teachers use cooperative learning. The questionnaire covers three features which are: value which assesses their perspectives and education beliefs; expectancy which assesses their expertise and the classroom leading to anticipated results; and the cost it might take to implement cooperative learning (Gisbert, Seuba, & Coll, 2017, p. 283). The subject is to develop anticipations of cooperative learning utilization and consequently assurance essential learning regarding cooperative learning applications in the teaching environment when they toil as teachers, so that cooperative learning becomes a customary preparation in learning institutes (Gisbert, Seuba, & Coll, 2017, p. 283). As a final point, the Index of cooperative learning reveals that Group B demonstrates a significant difference than Group A. Gisbert, Seuba, and Coll (2017) write that this indicates that undergoing cooperative learning permitted students to distinguish themselves as competent and with more aids to attain accomplishment by captivating into reflection the individualities of settings (p. 294).

**Case 2.** Nan (2014) writes that large classrooms are currently increasing in schools and colleges, so teachers need to find various teaching and learning strategies to incorporate in their lessons. In the study, *A Feasible Study on Cooperative Learning in Large Class College English Teaching* by Hua Nan, cooperative learning is considered a very convenient approach to apply in large college classrooms. It searches for ways cooperative learning is or is not practicable or efficient in large college English classrooms. Nan (2014) states, “Cooperative learning is defined as group learning activities organized so that learning is dependent on the

socially structured exchange of information between learners in groups and in which each learner is held accountable for his or her own learning and is motivated to increase the learning of others” (p. 1862). Nan (2014) reports that as one of the creative and efficient models, cooperative learning not only draws attention to group work or task-based interaction, but also drives learners to participate in a certain learning task actively. Moreover, it is a kind of teaching strategy to develop the students’ abilities to learn independently and autonomously in order to meet their need to learn in the form of group work (p. 1862). Nan (2014) refers to Johnson’s research pointing out that large groups can be broken down into small groups in order to have each student partake in learning activities. Nan’s (2014) research has two groups with a total of 170 participants. The first group of 70 participants is exposed to cooperative learning activities while the other group of 98 participants is controlled using standard learning techniques. In the first questionnaire distributed to the control and experimental groups to obtain data on English language learning in a classroom setting, the findings reveal that when the class is dominated by the teacher, the students feel anxious and unsure what they are learning. It adds that 70.60% of students are reluctant to contribute to class inquiry with little teacher facilitation; 48.26% of students are inattentive thus lacking cooperative learning; and 75.60% of students expect that in the future classrooms will be more student-centered (Nan, 2014, p. 1863-1864). The second questionnaire was for the controlled group only. The findings indicate that the 81.21% of students feel that cooperative learning provides an active and advantageous environment for English language learning; 89.26% of the students are dynamic which inspires students’ awareness in learning and verbal communication activities; 90.13% of students believe it also increases student participation to solve problems while increasing the listening and speaking of the English language; 80.36% of students feel that their anxiety decreases while their confidence and learning emotion

increases; and 80.18% of students think that cooperative learning is efficient allowing a multitude of opportunities for English speaking and listening. Consequently, it converts the dictated classroom to a student-centered environment (Nan, 2014, p. 1864-1865). Now, the pre-test indicates very little difference, but the posttest reveals that the experimental group scored a 74.69%, which is higher than the control group with 65.23%; the experimental group scored a 12.20% in listening and speaking while the control group scored an 8.54%; and there was little difference in writing (Nan, 2014, p. 1865-1866).

Cooperative learning fuels the interest of learning the English language. It increases the students' participation level as well as the effectiveness of teaching. Cooperative learning converts the traditional class to a student-centered environment. Cooperation in a large university English course not only can permit students to progress a sense of support to boost their effectiveness in their forthcoming effort, but also it can improve them to foster acquiring abilities. As additional instruction and knowledge methodology, cooperative learning will absolutely have a positive outlook in the discipline of dualistic language education, especially in big lecture university English schooling for non-English students (Nan, 2014, p. 1867).

**Case 3.** According to Chatila and Hussein (2017), students have difficulty learning biology due to not taking hold of biology concepts and the excess of the program of study that includes too many abstract concepts and/or subject matter like cells, genes, etc. in both secondary and higher education. The kind of knowledge, which involves understanding and utilizing by doing precise abilities throughout the course, is a major dilemma for students (Chatila and Hussein, 2017, p. 88). Additionally, due to the enormous and nonconcrete content in programs, teachers usually deliver the content irrespectively to students' interest, which prevents meaningful learning and outcomes in learning resources by memorization, and consequently causes learning difficulties (Chatila and Hussein, 2017, p. 88).

The study, *Effect of Cooperative Learning Strategy on Students' Acquisition and Practice of Science Skills in Biology* by Hanadi Chatila and Fatima Al Hussein, included students in 7th and 10th grade levels in a private high school in Beirut that integrates the cooperative learning method in their large class sizes. The groups included two in 7th grade and two in 10th grade. Each grade level has one controlled and one experimental consisting of 30 students each, totaling 120 students. Two biology teachers participated, one for each grade level. The study focuses on the students' achievement of scientific skills while implementing cooperative learning in their education (Chatila & Hussein, 2017, p. 88).

Since science education has been integrated overall with the scientific concepts to better gain comprehension, student learning has become the focus of teaching. For this reason, "The use of student-centered teaching strategies in classrooms within an overall inquiry-based pedagogy is an effective way to enhance students' academic performance, critical thinking, and problem-solving skills. So, through inquiry, students may learn both skills and concepts, and develop positive attitudes towards science" (Chatila & Hussein, 2017, p. 88). Educators worldwide have been searching for student development strategies and teaching methods to incorporate in classrooms.

One of the preferred studied educational approaches among science teachers is cooperative learning. The reason is that "it is considered as one of the most efficient instructional methods that enable students to work together in solving scientific problems, as it improves students' thinking skills and abilities, and has the potential to promote academic achievement, enhance social skills, and improve self-esteem by engaging students in an active learning environment" (Chatila & Hussein, 2017, p. 88-89).

Simply put, it allows learners to go beyond the textbooks and into a realm of in-depth learning, enhanced thinking, and class achievement. Chatila and Hussein (2017) affirm that

cooperative learning inspires student participation and engagement in their own education, it offers all students with prospects to make their views evident to others, permits students to dialogue about their own notions, and authorizes students to contemplate the thoughts of their peers, which improves their developed thinking skills (p. 89). Even if the results reveal no significance in grade 7, the researchers assert the complexity of the content may affect student end results, but grade 10 demonstrate significance in achievement and learning (Chatila & Husseiny, 2017, p. 89). Cooperative learning has a definite effect on instruction and knowledge when utilizing scientific development skills, although not always momentous, but it does enhance the knowledge and preparation development of the learned abilities and benefit the knowledge of innovative skills (Chatila & Husseiny, 2017, p. 95-96).

To conclude, the cooperative learning pedagogical method has greatly demonstrated that it can develop into any learning and teaching approach to accommodate diverse learners in today's classrooms. With today's constant change in the standards, cooperative learning has exposed its transformative nature to support curriculum and instruction as well as its implementation challenges. Thus, the theoretical frameworks have been used as efficient blueprints to establish cooperative learning as a pedagogical model for academic achievement, the learning process, and for instructional methods.

**Case 4.** Teachers define how they teach by their principles and methodologies. Transforming from conventional educational teacher steered education to techniques that highlight the students understanding is a method that engages letting go of selected objectives and implementing others (Sharkey & Gash, 2020, p, 1). Since 1971, Piaget's learner centered methodology has been the hub of primary education programs. Education reveals it's imperative in transmitting importance and impacts children's social and individual growth (Sharkey & Gash, 2020, p, 1). Thus, Piaget's descendant is constructivist.

The Irish study, Teacher' Constructivist an Ethical Beliefs conducted by Maria Sharkey and Hugh Gash, focuses on how teachers are influenced that is by their own beliefs and constructivism. The main aspect of constructivism is that we all have our own individual production and that how and what we create is different. The focus of this study is to look at the connection between teacher views on constructivism and their individual ethics of transformation included in this method to instruction and knowledge. The researchers use convenience and snowball methods on 50 primary teachers. Two questionnaires were administered, the Constructivist Learning Environment Survey (CLES) and the Ethics Position Questionnaire (EPQ). Out of 50 participants, 37 returned the surveys. Responses were measured using the Likert scale. The result demonstrated that there were positive correlations between idealism and constructivism. The fundamental idea is perspective, therefore, show challenging to alter, but may not be impractical with the teacher's understanding being intensified through inquiry (Sharkey & Gash, 2020, p, 7). The study reveals that teachers high in idealism are beyond prone to agree regarding constructivism. Sharkey and Gash (2020) stated that these surveys support instruments on which to root conversation about teaching space preparation, so granting teachers with a channel to exhibit on what they perform and what is greatest for knowledge in their schoolrooms (p. 7). Overall, the research establishes that there is a link between beliefs and practice and that teachers get inspired by it. Teacher beliefs also determine how curriculum is implemented. Philosophies are deemed to be the greatest forecasters of the activity's individuals take in their daily activities to idealistically demonstrate viewpoints as the ultimate prognosticators of constructivist practice (Sharkey & Gash, 2020, p, 8).

According to Sharkey & Gash (2020), as with John Dewey's approach, our thoughts use investigational procedures to enhance our knowledge of understanding. (p. 2). During this

time, the constructivist teacher's role is to expedite the teaching and learning process. But, constructivism requires us to see others' perspectives. The explanation may be unique from a student's or from any other person's explanation, and this relates to what we are teaching and to the social perspective we are striving to generate (Sharkey & Gash, 2020, p, 3).

### **Summary**

Cooperative learning emphasizes utilizing the students' own individual experiences to expand on it using their newly acquired knowledge gained from the hands-on activities and/or from others' experiences. Cooperative learning entails communication, involvement, engagement, and problem-solving skills. Thus, cooperative learning provides a student-centered methodology as students work in a group. Students can take individual ownership and responsibility of their learning and final outcomes of achieving their goals. The students' critical thinking skills and social skills amplify as they are sharpened as they are emphasized through collaboration and the exchange of ideas within the team. The classroom environment is seen as a constructive setting that allows students to be actively engaged and independent. Utilizing constructivist methods in the classroom promotes flexible learning to offer differentiated learning. Being goal-directed, innovated, interactive, and interdependent, they all offer interpersonal experiences associated with cooperative learning. As stated before, cooperative learning utilizes the individual's prior knowledge to create new knowledge using the perspective and personal experiences of others. Still, the foundation for constructivism is the individual's personal experiences. Social constructivism emphasizes cooperative learning through culture, collaboration, and communication as per Vygotsky. The idea is for the individual student to uncover and discover complex information and make it their own as part of a student-centered environment. In a student-centered environment, knowledge is built and constructed

demonstrating the social constructivist approach while accentuating the social framework of knowledge.

## CHAPTER III

### METHODOLOGY

In this qualitative research, the methodological section demonstrated the initial process for this case study as well as the data collection and the data analysis course of action.

Consequently, “it can be argued, provides a stronger understanding of the research problem or question than by itself” (Creswell, 2014, p. 264). This section exhibited how the collected data was construed. The methodology was tailored as it progressed in order to gear the research towards uncovering the answers to the research question stated.

#### **Participants and Setting**

The science teachers were selected using purposeful sampling due to the commonality of the discipline and the implementation of cooperative learning in science. Creswell (2013) asserted that the participants “purposefully inform an understanding...of the phenomenon in the study” (p. 156). A recruitment notice was handed to them to introduce myself and the purpose of the research being conducted with a consent form.

This study included about eight science teachers at A-Z Elementary. A-Z Elementary had about 983 students and about 50 teachers from Pre-K thru Fifth Grade located in Elmer, Texas. It was mostly Hispanic, an at-risk population, and economically disadvantaged. Thirty-six classrooms were self-contained and six are interchangeable. Some are Dual Language

classrooms and others are English classrooms. The prime focus was relating 5<sup>th</sup> grade science teachers' instructional expertise and the Cooperative Learning Model for Academic Achievement. Pseudonyms were issued.

### **Qualitative Research**

Qualitative research was utilized to obtain data from one-to-one interviews. Qualitative research was mainly used to reveal common trends in the case. The qualitative research purpose was to gain insight into fundamental reasons and rationales. Qualitative research was selected to uncover what current themes were evolving in the school classrooms as it conveys to teachers utilizing cooperative learning in their weekly lessons.

Qualitative research was described as an inquiry into social events occurring in their natural venue in order to seek an in-depth understanding. It depended on the direct experiences of human beings to focus on the “why” and the “how” of the research. The qualitative research main purpose was to go deeper into the participants' environments for a better understanding and to gain meaning from their inspirations.

Qualitative research identified the meaning of data. It investigated the exploration of concepts and investigates experiences in more detail. Qualitative was important because it delivered in-depth details of the participants' way of behaving and comprehending the experiences gained in their daily situations. The attributes of this research included a natural setting, a developing design and eight participants. The data of the research were collected by conducting one-to-one interviews. One-to-one interviews provided an opportunity to the participants' beliefs, thoughts, experiences, and motivations. The data were examined for patterns through the usage of coding.

The data of the research were reviewed, explored, and created primary codes. The primary codes were reviewed and combined into themes. The themes were interconnected to generate a rich understanding of the data to make it possible for a developed theory/ argument. The data collection initially allowed for a detailed and holistic insight into the participant's world. Qualitative coding, based on Grounded Theory (Charmaz, 2014), was used in this research study to categorize the excerpts of the obtained data and its analysis to reach a final theory. This theory was my hypothesis. The hypothesis offered future researchers a framework to further the research study.

According to Charmaz (2014), grounded theory surfaced as early as 1967 when Barney B. Glaser and Anselm L. Strauss published their book while conducting their study. The researchers gave their data specific logical care and delivered their own speculative evaluations while building systematic strategies that led to generating their own theories from the data collected. For this to be achieved, grounded theory must include immediate participation in accumulating data, developing subcategories that lead to thematic coding, comparing analysis as it progresses, enhancing pre-existing theories further, hypothetical sampling, a continuing literature review, and distinguishing any disparities in the research data. Their goal was to go above and beyond descriptive studies by developing modern explanatory theories with their research. Strauss brought several notions like problem-solving practices and open-ended studies. Strauss assumed that humans interacted dynamically and not routinely which influenced their actions. Glaser, on the other hand, utilized coding for qualitative analysis. Strauss and Glaser had their differences in approaches, but both met eye to eye when it came to the grounded theory being a means of verification.

### **Constructivism as a Methodological Framework**

Constructivism was a learning theory that was applicable to this case study. Constructivism applied that human beings obtain knowledge and implication between the interaction they encountered and concepts they perceive. The participants got their individual knowledge and experiences through their involvement and interactions. Vygotsky, a constructivist, believed that learning occurs when the learner obtained knowledge from support or collaboration (Charmaz, 2014). The goal of constructivism was to comprehend certain circumstances.

Within the grounded theory, constructivism concentrated on producing its own theories from the developing data instead of the already established theoretical frameworks. It offered alternative explanations or theories to gain additional perspectives on the research being conducted. Grounded theory methodologies may begin with inductive reasoning and theoretic evaluations, but we differed in assumptions, viewpoints, and theoretical plans regarding grounded theory (Charmaz, 2014, p. 14). It allowed flexibility in the research process and pathways. Grounded theory has grown beyond its early beginnings and into other disciplines through the years.

### **Constructing Grounded Theory as a Research Method**

Grounded Theory was a qualitative research method that supported my ability to obtain new theories centered on the iterative compilation and study of actual data. Grounded Theory was distinct from various methods that already had a developed hypothesis for me to confirm or reject. Basically, Grounded Theory was distinct in that it collected the necessary data through various means of interviews to extract the theory or theories from the data collection itself. Once data was collected and went through analysis, it then went through an iterative process. The

iterative process allowed me to extract their own theories. The analysis guided me to a theoretical discovery or discoveries.

Grounded Theory was advantageous in that it embodied real-world situations. In my case study, these situations included actual school classrooms where teachers were conducting their daily lessons. Teachers have been observed on some occasions while delivering their lessons specifically when they were implementing cooperative learning activities. The students' outcomes of the cooperative lessons were also observed to see the final learning product after implementing cooperative learning in the classroom. I experienced firsthand the teacher and students in action in a learning environment. Teachers have also been interviewed one-to-one on their experiences and teaching philosophy, the implementation of cooperative learning in their lessons, and outcomes. These interviews were all transcribed to later be used in data analysis. This may have had its drawbacks, as I may have had difficulty recruiting participants, and/or some participants may find it time-consuming like in the interviews.

With the data collection process, known as theoretical sampling, the researcher starts to recruit participants like teachers in this study. The interviews were then scheduled and completed with each participant as well as transcribed. The interviews allowed a deep and thorough discovery of cooperative learning implementation that included personal and relevant insights from the participants. The scheduled classroom observations were also completed during this stage. Thus, open coding was initiated after the data collection and analysis. In the first step in coding and open coding, the interviews were put into distinctive groups. Each group included common or distinctive attributes. These groups are put into codes. Codes or coding was a means of discovering concepts and discovering relations between them. If more theoretical sampling was conducted, the distinctive groups were also changed.

Once open coding was completed. Meaning, putting the data into common or distinct groups. The common or distinct groups were then put into code categories which summed the individual group of codes. Categories were each of the distinct groups placed together with common attributes. This was axial coding. Axial coding established the relationships among the categories. In addition, selective coding was then developed to tie all the categories together to finalize the researcher's own theory. Selective coding helped articulate a stable theory for qualitative research. In utilizing the Grounded Theory method of assessing qualitative data, open coding, axial coding, and selective coding were orchestrated phases in a series of events.

### **Saldana's Model**

Saldana's first coding phase (2016) refers to "open coding" as Initial Coding. It is basically the same process of collecting data, from open-ended interviews, observations, journals, artifacts, documents, notes, videos, etc. It is emerging yourself into the research setting or environment and experiencing it firsthand. Data is gathered in the research environment and its surroundings. Open coding connects Grounded Theory to the interviews conducted. After the data is collected, the analysis begins. The data is looked at numerous times to be put in excerpts that reflect commonalities. The researcher can identify emerging codes or categories. Since coding is cyclical, constant revisits, or memoing, may occur constantly. I compare codes or categories for any differences or similarities. This system initially aids in the interpretation, analysis, and categorization of the other upcoming coding and categorizing phases.

In addition to Initial Coding, Saldana (2016) may combine In Vivo coding. In vivo coding uses the participants' own words and is utilized as a part of the coding. So, during the interview process, it is crucial to ask open-ended questions where the participant can elaborate more in their responses. I can probe the participants during the interview to go in depth into their

responses. The more in-depth insight the researcher receives the better the outcome when coding or categorizing since In Vivo utilizes direct quotes from the participant or participants.

Furthermore, Saldana (2016) model may utilize Process Coding as well during Initial Coding simultaneously. Process coding is when the researcher does observations in the research setting. Process coding uses visible pursuits or movements in the research environment that can be tied to others such as the interviews or gathered artifacts. Some research studies may end the coding process at phase one, but when utilizing Grounded Theory Saldana (2016) requires additional phases. Saldana's second coding phase may include various coding methods such as axial or thematic coding. Axial Coding basically assembles the coded data from phase one that has similarities or differences to be themed simultaneously. On the other hand, Thematic Coding may be very instrumental in stage two. In thematic coding, qualitative data is studied by examining the value of keywords, phrases, and sentence development. When the researcher uses thematic coding to investigate data, for example, the researcher can discover which topics are most common in coding. When interviews are conducted, transcribed, or scripted, a theme can be drawn from a monotonous concept. It uncovers what the work is actually about and can be beneficial in forming insights and evaluations. In interviews, it can be used to identify what others are similarly stating or how their own perceptions are evaluated by other interviewees in the qualitative research.

In Saldana's (2016) third cycle, it is coded and categorized. When utilizing Grounded Theory in qualitative research, theoretical coding may be used. In theoretical coding, it demonstrates how the final categories are linked to the essential subcategories which are obtained by reading and rereading the data to identify patterns. Grounded theory, in theoretical coding, requires the researcher to evaluate data with data and later assess data with the codes acquired since coding is a cyclical process. Using open coding to begin the data analysis, it then allows the

images of a common theme to emerge, allowing the researcher to put the codes into individual categories. Once that is completed, a framework of the data is constructed, and an overall theory is developed.

### **Thematic and Semantic Analyses**

The thematic analysis is an advanced stage when finishing open coding. Thematic analysis is a good approach to research when the author wants to find out participants' views, opinions, and values of the experience. In this study, I take the inductive approach which involves allowing the data to determine themes. The inductive approach represents a route, from specific observations to pattern recognition and further to a general conclusion. There's also the distinction between a semantic and a latent approach. A semantic approach involves analyzing the explicit content of the data. A latent approach involves reading into the subtext and assumptions underlying the data. I am determined to use a semantic approach to explore the content of the data.

Semantic analysis can be done by using semantic analysis software, such as JMP (2022) and BayesiaLab (2023), with semantic mapping strategies. Semantic mapping is a visual strategy that expands concepts, extends knowledge, and builds new associations of these concepts. This helps researchers to identify and understand concepts and relationships among these concepts.

### **Data Collection**

Data sources for this research included a face-to-face interview. The data from the open-ended interview was transcribed, coded, and formulated to explain thematic

connections on how the teacher implements and perceives cooperative learning strategies and needs in a constructivist classroom setting during science. According to Creswell (2014), “The process of coding involves aggregating the text or visual data into small categories of information, seeking evidence for the code from different databases being used in the study, and then assigning a label to the code” (p. 184). Thus, Baxter and Jack (2008) continued to state that:

Each data source is one piece of the ‘puzzle,’ with each piece contributing to the researchers understanding of the whole phenomenon. This convergence added strength to the findings as the various strands of data are braided to promote a greater understanding of the case. (p. 554)

The open-ended interviews were laid out in an informal and casual environment with a consistent structure (Marshall & Rossman, 2016). This approach made the interviews flexible and easily manageable for the interviewer and the interviewee, making it comfortable for the participant to provide detailed insight into the implementation of the cooperative learning approach. The interviews utilized about 60 minutes and determined the cooperative learning approach, its process, and the teacher’s perspective on implementing cooperative learning during science time. Questions solicited the teacher’s perspectives and expertise to inquire about cooperative learning. As such, the “knowledge we gained assisted the author and colleagues in designing better classroom teaching methods and professional development programs based on feedback from teachers. It also helps us provide better and additional services to teachers where needed and requested” (CSLP, 1998, p. 1).

## **Data Analysis Overview**

To evaluate the teacher's individual perspective, I conducted an interview, at the beginning to construct the demographic foundation and their practice beliefs and/or instructional experiences in incorporating cooperative learning in their constructivist classroom setting during science. It was utilized to determine the teacher's background, experiences, and beliefs. I used it to assist individually in getting to know them as an educator, their teaching preferences, and their knowledge of using cooperative learning strategies. Teacher interviews were incorporated to draw and reflect on their inner thoughts, feelings, and views on incorporating cooperative learning strategies during science.

The interview data collected was thoroughly read to locate developing codes using the constant comparison analysis method "in order to develop emergent themes, to assess the adequacy, relevance, and meaningfulness of themes, to refine ideas, and to identify conceptual boundaries" (Leech & Onwuegbuzie. 2007, p. 565). "After all the data have been coded, the codes are grouped by similarity, and a theme is identified and documented based on each grouping" (p. 565). The themes were listed in the results.

## **Purpose and Rationale**

The purposes of this qualitative case study research were: (1) to examine 5th grade. Science teachers' perceptions of cooperative learning, (2) requirements in implementing cooperative learning, and (3) how their beliefs impact teaching and learning in a classroom of diverse learners. This study was designed to look at the affiliation between cooperative learning implementation and the teachers' instructional beliefs.

## **The Rationale of the Research Questions and Data Analysis**

This case study provided an overview of the educational rapport between cooperative learning and the teacher's instructional beliefs. So, I ask questions: What are the teachers' perceptions and requirements in implementing cooperative learning, and how do their beliefs impact teaching and learning?

Cooperative learning has been in the spotlight for many years. Numerous research studies have been conducted on its implementation, challenges, advantages, benefits, etc. The challenge of all was not how to implement cooperative learning but how much time to put into planning and the supplies required to complete such student-centered activities. Supplies were crucial for students and teachers to reach accountable performances in their classroom lessons. Cooperative learning lessons depended on the supplies required to provide students first-hand on how to develop, communicate, problem-solve, and present their task as a group to achieve critical thinking skills and comprehension of what was being taught so they in turn can apply that knowledge in the real world.

To reach the root of such a cause, teacher interviews were conducted. They were then put in the Joint Marketing Program (JMP, 2022) for further analysis, which was discussed in detail in Chapter Four. JMP used tables and graphs to expose patterns that can be put into reports to reach several conclusions. Thus, as a researcher, I can interact with the data to verify my hypothesis.

### **Summary**

Qualitative research allows a deeper understanding of the insights of cooperative learning. As a researcher, the qualitative research methods used permitted the participants to analyze their responses, think, and rethink not only their responses but their actions, needs, and wants for implementing cooperative learning in their classrooms. Kathy Charmaz provided explicit

principles for conducting qualitative research with grounded theory. It offered basically the foundation for building and handling the stages of inquiry, integration, and analysis. In turn, constructivist grounded theory provided the researcher with theories while uncovering new theories. Through qualitative research, I used the grounded theory methodology to situate the case study. The experiences of the participants came to light. This was essential for the research due to its rationale and exploratory findings.

Saldana's coding methodology made it reasonable for the data to be further broken down to capture what the responses in the interviews were about. By breaking them down into subgroups and categories, the data collected from the interviews were better analyzed critically, reached a deep understanding of the data, and developed new theories for further exploration. The goal of coding was to reach and identify themes associated with the data. Themes were uncovered and represented patterns to captivate commonalities, relationships, and the research purpose.

## CHAPTER IV

### RESULTS AND FINDINGS

As I examined this chapter, technically, cooperative learning came with its advantages and disadvantages when managing unique cooperative learning activities. It offered a series of benefits for students and teachers that were quite possible but without the proper supplies, some cooperative learning may have to be altered or impossible making it difficult to achieve academic achievement. If supplies were constantly offered and accessible for teachers, cooperative learning would be easily implemented, and many disadvantages would be addressed. It is crucial to note that for cooperative learning to be successfully implemented teachers must decide what they are going to need, how long it's going to take, and whether it is worth the dedication to accomplishing it effectively.

#### **Data Description**

The data was provided by eight elementary participants. The eight participants taught fifth-grade students utilizing cooperative learning strategies. The eight participants had numerous hours of professional training in several subject areas including science. Theoretically, the eight participants have decided to implement cooperative learning of science to positively affect student learning by exposing them to other points of view, collaborative skills, interdependence, mutual problem solving, and at the same time striving to reach a common goal. The participants thought in their individual interviews that cooperative learning skills can be applied to their personal and

professional lives. It was part of the 20<sup>th</sup>-century objective of the district as well as the participants. Overall, cooperative learning was believed by the participants in their interviews to have the ultimate potential to produce various engagement opportunities for students to experience that can transform their individual learning, resolution skills, collaboration skills, and work cooperatively in various settings. The participant's commonality was the social aspect of cooperative learning to incorporate cooperative learning skills collectively to transform student experiences and learning. The participant's learning design was to identify learning targets to make cooperative learning activities decisions, best grouping formations, and final assessment.

The approach to the data collection used in this qualitative research was semi-structured interviews. The eight participants were interviewed face-to-face individually with open-ended questions for about an hour or until the interview was over. Interviews were transcribed for research and coding used. The significance of using semi-structured interviews for my research as a tool was to understand the teacher's perspectives on cooperative learning implementation and gain insight into their teaching practices and beliefs. The semi-structured interview questions were used as a guide to enable the interviewee to open to other areas that may lead to a deeper discussion that may not have come from a structured interview. These semi-structured interviews gave me opportunity to uncover other areas or new topics that may have been overlooked or may also stimulate new research in the future to be conducted.

### **Open Coding**

The open coding method was the sensible approach by which codes, to the noted information and experience, were pinned during qualitative data analysis. Open coding was attained by piecing information into significant representations and explaining them in specific words to a brief chronological sequence of keywords. In my qualitative research, it made it easier

to explain the responses received during the interviews of each participant. By assigning a code word or phrase, it helped the researcher examine and review the findings. Open coding connected Grounded Theory to the interviews conducted. This system aided in the interpretation, analysis, and categorization of each.

JMP (2022) was the tool utilized for inputting the data collected and outputting the data results for coding and interpretation. JMP (2022) produced data tables that aided in comparing the results with other data tables. This enabled coding to be easily visualized and compared across other participants to uncover the relationships among them. Using JMP (2022), I transmitted the results with its graphed outputs. JMP (2022) categorized the data into phrases and frequencies to aid in the data analysis as well as the coding process of the research.

### **Reporting Open Coding by Different Participants**

There were eight participants, and they were labeled PA, PB, PC, PD, PE, PF, PG, and PH. The outputs consisted of Phrases and Frequencies. There were three rules deciding the “length” of the Term and Phrase lists, the amounts of the phases, and frequencies. The first was the amounts that were decided to refer to the frequencies of the terms. The second was the amounts that were decided by referring to other cases of the participants. For example, if the given phrases received a higher frequency in Participant B, the same phrase should be kept in Participant C, though the frequency of the phrase was much less than the one in Participant B (refer to Appendix A). Third, I removed some phrases, even though their frequencies were high, the phrase was not relevant to the focus such as “taking 60 hours.” Briefly, all terms and Phrases refer to Appendix A.

There were three aspects for each participant: Experience, Practices, and Perceptions. The data obtained on experience from each participant was crucial to learn more about each in order to uncover and explore other aspects of their experiences and abilities. Knowing the experiences of

each participant determined an understanding of their work ethics and environment. The data obtained from each participant on their practices determined how they were able to implement their philosophy and expertise in the classroom. Each participant's practice determined how they were able to implement cooperative learning in the classroom. The data obtained from each participant on their perceptions aided in how each was influenced in their thoughts and teaching behaviors. Perceptions of each participant helped to understand them individually because everyone's views vary.

### **Participant A's Coding Outputs and Descriptions**

There were three aspects of the open coding outputs for participant A: Experience, Practice, and Perceptions. Table 4.1 indicates that the Terms and Phrases are learning, cooperative, science, and cooperative learning. in experience, practice, and perceptions. The analysis starts with selected coding, where I recognize the meaning of the Terms and Phrases, potentially the elements of the themes.

**Table 4.1****Participant A's Open Coding Outputs**

<i>Participant A's Experience Terms and Phrases (Panel A)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Development, and Professional Trained,	Professional Development, Cooperative Learning
<i>Participant A's Practice Terms and Phrases (Panel B)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Cooperative, Learning and share	Cooperative Learning
<i>Participant A's Perception Terms and Phrases (Panel C)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Students, Learning and Cooperative	Cooperative Learning, Students, Teachers Thought Process

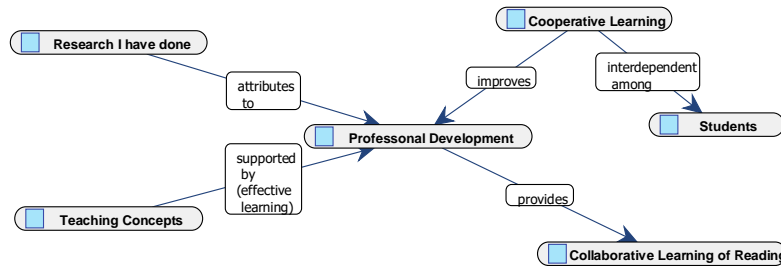
**Participant A's Experience**

In the open coding of Participant A's Experience data, two phrases were selected:

Professional Development and Cooperative Learning. Based on the selected phrases, I embed the Terms and Phrases of the Experience into the contexts. The blue fonts mean these words or phrases have been highlighted. The blue fonts representations are used across all analysis. We also notice that selected Terms and Phrases only provide a piece of frequency evidence, which may not use to make the final decision about the themes.

1. I do a lot of research I have done on my own and some professional development classes.

2. Yes, I believe attending professional development is always a great way to learn different ideas and ways of teaching concepts.
3. Structured cooperative interdependence among students.
4. I've been trained on campus by my peers. I was trained on collaborative reading groups.



**Figure 4.11: Thematic Graph of PA's Experience**

My attempt to recognize the thematic elements of Participant A's statement in the Experience. The first step is to embed the selected codes into the contexts, and then identify two thematic elements: Professional Development and Cooperative Learning (Collaborative Learning), which support each other. I believe that Professional Development is the first central concept and cooperative learning is the second one.

### **Participant A's Comments and My Reflection on the Experience Data**

Participant A commented that

I have a bachelor's degree and have taught 13 years. I do a lot of research. I have done on my own and some professional development classes I have gone to. I teach each category and concept. I've been trained on campus by my peers. I was trained on collaborative reading groups.

Yes, I believe attending professional development is always a great way to learn different ideas and ways of teaching concepts.

## My Reflection

There is an alignment between the thematic analysis and Participant A's comments. In Figure 4.11, the central theme is Professional Development. It connects with several second-level themes: Teaching Concepts, Cooperative Learning, and Collaborative Learning of Reading.

## Participant A's Practice

In the open coding of Participant A's Practice data, two phrases were selected: Cooperative Learning and "Share." Based on the selected phrases, I embed the Terms and Phrases of the Experience into the contexts.

1. Most of the cooperative learning happen in science lab.
2. The staffs gave us material we could use in our classroom, some for cooperative learning.
3. We are willing to share our ideas with one another.
4. Partner Talk or think, pair, share these cooperative learning helps the students to get ideas from each other.

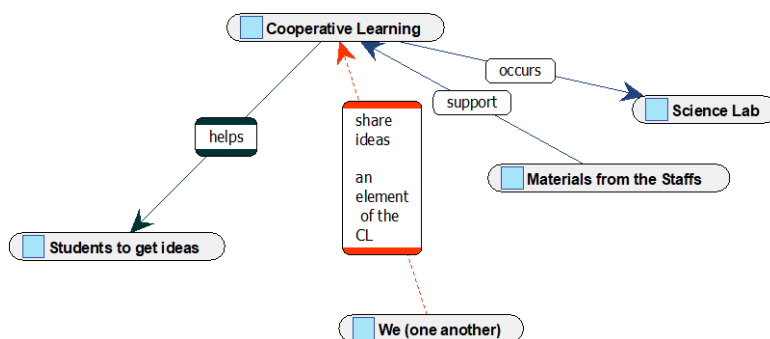


Figure 4.12: Thematic Graph of PA's Practice

I recognize the thematic elements of Participant A's statement in the Practice. The first step is to embed the selected codes into the contexts, and then identify two thematic elements: Cooperative Learning and "Share." I believe that Cooperative Learning is the central concept, and "Share" is only the word to describe the relationship between cooperative learning and the participant.

### **Participant A's Comments and My Reflection on the Practice Data**

Participant A claimed that

Before I build schema, during I monitor and sometimes guide with questions, after I have them fill out an exit ticket to make sure they comprehend the concept taught. I prepare my initial teach questions to help the students scaffold prior knowledge, so they have some background knowledge to use in their cooperative learning groups. Before the students are asked to journal and after they fill out an exit ticket or Write to Learn. Partner Talk or think, pair, share these cooperative learning helps the students to get ideas from each other. Students not knowing what to share with their classmate. I have overcome this obstacle by placing anchor charts around my classroom that the student can refer to.

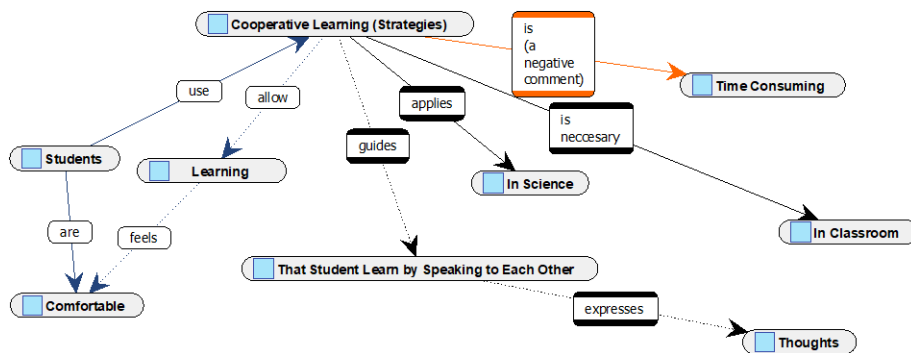
### **My Reflection**

Participant A's comments are supplements to the analysis. There is an alignment between the thematic analysis and Participant A's comments. As shown in Figure 4.12, the central theme is Cooperative Learning, which connects with several second level themes: Science Lab, Materials from the Staff, and Students to Get Ideas. Figure 4.12 represents the association among these themes. We notice that Cooperative Learning requires the support of Science Lab and Materials, these two themes.

## Participant A's Perceptions

In the open coding of Participant A's Practice data, three phrases are selected: Cooperative learning, Students, Teachers, and Thought Process. Based on the selected phrases, I embed the Terms and Phrases of the Perceptions into the contexts.

1. Students have been allowed to use cooperative learning strategies, I think the student feels more comfortable when answering questions or taking a quiz.
2. One disadvantage is that cooperative learning is time consuming.
3. Cooperative learning in science is the ideal way for students to learn.
4. That cooperative learning is necessary in the classroom.
5. Students learn by speaking to one another and being able to express their thoughts.



**Figure 4.13: Thematic Graph of PA's Perceptions**

The semantic analysis recognizes the thematic elements of Participant A's statements in the Perceptions. The first step is to embed the selective codes into the contexts, and then identify four thematic elements: Cooperative Learning Strategies, and Students.

The analysis also indicates that cooperative learning is a good strategy for students to learn. Another analysis as shown in Figure 4.13 indicates that cooperative learning strategies have been

applied in science learning. Stated differently, the cooperative learning strategy is a promising strategy in science learning.

### **Participant A's Comments and My Reflection on the Perceptions Data**

Participant A claimed that

The students need to have hands on experience to help them better understand the concept being taught. The students get excited about learning. It teaches students accountability as an individual and as a group. It teaches students how to become a leader. It's an excellent way to allow students to think critically without relying on the teacher for answers. I believe cooperative learning in science is the ideal way for students to learn. I believe it provides experiences that develop both good learning skills and social skills. I think that cooperative learning is necessary in the classroom. Students learn by speaking to one another and being able to express their thoughts.

### **My Reflection**

Participant A's comments on the Perceptions are supplements to the analysis. There is an alignment between the thematic analysis and Participant A's comments.

Figure 4.13 represents the association among these themes. We can visualize Cooperative Learning requires the support of Science Later and Materials. In addition, there are six connections between Cooperative Learning Strategies and other elements. This indicates that "Cooperative Learning Strategies" is a dominant theme in PA's Perceptions data.

### Participant B's Open Coding Outputs and Descriptions

There are three aspects of the open coding outputs for participant B: Experience, Practice, and Perceptions. Table 4.2 indicates that Terms and Phrases in Experience, Practice, and Perceptions. The analysis starts with selective coding, where I recognize the meaning of the Terms and Phrases, potentially the elements of the themes.

**Table 4.2**

#### Participant B's Open Coding Outputs

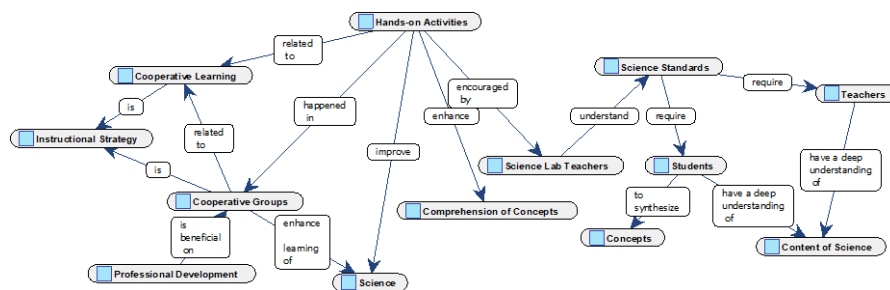
<i>Participant B's Experience Terms and Phrases (Panel A)</i>	
Terms Selected	Phrases Selected
Science, Cooperative Learning	Cooperative Groups, Science lab
<i>Participant B's Practice Terms and Phrases (Panel B)</i>	
Terms Selected	Phrases Selected
Science and Supplies.	Cooperative Groups.
<i>Participant B's Perception Terms and Phrases (Panel C)</i>	
Terms Selected	Phrases Selected
Cooperative, Groups	Cooperative Groups

#### Participant B's Experience

In the open coding of Participant B's Experience data, several phrases were selected: Science, Students, Cooperative Learning and Training, Cooperative Groups and Science Lab in the Experience. I embed the Terms and Phrases of the Experience into the contexts.

The analysis starts from the selected coding, where I recognize the meaning of Terms and Phrases, potentially the elements of the themes.

1. To learn and teach science, we must be able to explore through hands on activities to be able to gain the experience to comprehend the concepts.
2. I also use cooperative groups to teach science. By using cooperative groups, students can express their ideas, thoughts, and conclusions with other.
3. Science standards for 5<sup>th</sup> grade elementary students incorporate a high level of rigor that requires for students to be able to synthesize concepts.
4. Texas science standards require teachers and students to have a deep understanding of not just 5<sup>th</sup> grade content (readiness standards) but also of 3<sup>rd</sup> and 4<sup>th</sup> grade science standards.
5. Cooperative learning is an instructional strategy that allows for students to collaborative with others and allows them to critically think and problem solve together.
6. I also use cooperative groups to teach science. By using cooperative groups students can express their ideas, thoughts and conclusions with others.
7. Our campus provided training on CIF protocols and one of the strategies is using cooperative groups during instruction.
8. Professional development would be beneficial on cooperative groups to provide myself and colleagues more information to using and implementing cooperative groups in our classroom to ensure we are using these in an efficient manner that benefits our students.



**Figure 4.21: Thematic Graph of PB's Experience**

I did an analysis of PB's Experience data and selected the thematic elements from these candidates of terms and phrases. The first step is to embed the selected codes into the contexts, and then identify four thematic elements: Hands-On Activities, Cooperative Groups, Science Lab Teachers, and Science Standards. I believe that these four concepts are central concepts that can be the elements of the themes. I found that Cooperative Learning, Instructional Strategy, Comprehension of Concepts, and Content of Science are the possible candidates for the themes as shown in Figure 4.21.

### **Participant B's Comments and My Reflection on the Experience Data**

Participant B indicated in the interview that

To learn and teach science we must be able to explore through hands on activities to be able gain the experience to comprehend the concepts. We all learn through prior experiences as we activate our prior learning to make connections. I also use cooperative groups to teach science. By using cooperative groups students can express their ideas, thoughts, and conclusions with others. This helps them elaborate on their thinking and provides for students to converse with one another. I'm always looking for professional development like online webinars like (CAST) Conference for Advancement.

Participant B also revealed in the interview that

Science standards for 5th grade elementary students incorporate a high level of rigor that requires for students to be able to synthesize concepts that spiral on back to grades 3rd and 4th. Texas science standards require for teachers and students to have a deep understanding of not just 5th grade content (readiness standards) but also of 3rd and 4th grade science standards (supporting standards) and process skills that require students' problem solve, make inferences and graphic interpretations. As a teacher I must ensure that students are not just exposed but also make sure that they understand standards. The use of data from benchmarks prior to mandate state assessment (Science STAAR) provides such feedback that helps guide instruction and monitoring of student progress.

Participant B concluded in the interview that

Cooperative learning is an instructional strategy that allows for students to collaborative with others and allows them to critically think and problem solve together.

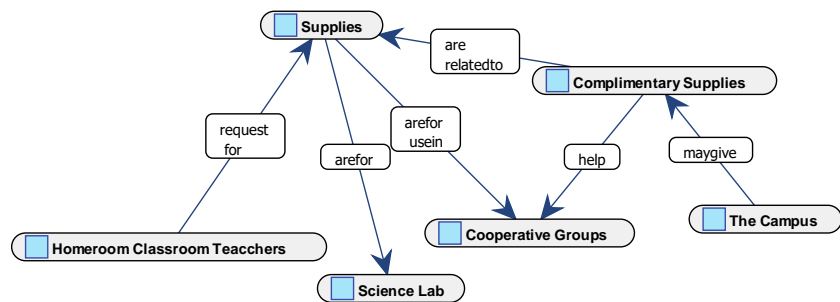
## **My Reflection**

Participant B's comments on Experience are supplements to the analysis. There is an alignment between the thematic analysis and Participant B's comments. The Thematic Graph as shown in Figure 4.21 represents the association among these themes.

## **Participant B's Practice**

In the open coding of Participant B's Practice data, three phrases were selected: Hands on Activities, Cooperative Groups, Science Lab Teachers, and Science Standards. Based on the selected phrases, I embed the Terms and Phrases of the Perceptions into the contexts.

1. At the beginning of the year, the homeroom classroom teacher sends a request for donations home for supplies to be used in the classroom and science lab.
2. As part our district timeline, we are given a list of supplies that we need to purchase to implement our science curriculum.
3. I am able to purchase supplies at the beginning of the year, but I often find that I may need to purchase other supplies.
4. I purchase these out of pocket, and it becomes expensive to be able to furnish these supplies for use in cooperative groups.
5. Our campus furnishes some complimentary supplies.
6. I have in the past received complimentary supplies when I have participated in collaborative groups through Region One Science Collaborative.
7. In planning for a cooperative learning activity, I make sure that student roles and expectations are clearly identified in the activity.
8. suggestions that may help science content delivery through hands on activity, cooperative groups, or a fun engaging activity.
9. I may need to purchase other supplies and I purchase these out of pocket, and it becomes expensive to be able to furnish these supplies for use in cooperative groups.
10. In cooperative groups, my role before is to plan and ensure that all supplies are readily available to students.



**Figure 4.22: Thematic Graph from PD's Practice**

I did an analysis on PB's Practice data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selected codes into the contexts, and then identify four thematic elements: Supplies, Complimentary Supplies and Cooperative Groups. I believe these three concepts are central concepts, which can be elements of the themes.

### **Participant B's Comments and My Reflection on the Practice Data**

Participant's B claimed in the interview that

My planning time for science lab is weekly with my grade level and I plan daily for science. I usually make modifications to my instructions as I observe my students work through the daily lab and I notice that adjustments need to be made as I obtain feedback from my students through exit tickets, questioning, classroom talk, and my observation instruction delivery. I am constantly researching or looking for ideas to implementing our Districts science content. I am part of the science curriculum writing group, but I also look for science groups that provide networking and collaborating ideas on science with dos and don'ts. Planning for any content is important not just science. It's essential to discuss and plan with other colleagues as they are experts in their fields and have strengths in a particular subject and their ideas may help all the grade level especially those new to grade level or the veteran

teacher looking for ideas to redefine or improve their instructional methods with their students. We all have room to grow and improve ourselves to become better teachers.

### **My Reflection**

Participant B's comments on the Practice are supplements to the analysis. There is an alignment between the thematic analysis and Participant B's comments. The Thematic Graph as shown in Figure 4.22 represents the association among these themes. For example, Participant B mentioned Science Lab and Supplies.

### **Participant B's Perceptions**

In the open coding of Participant B's Perceptions data, several phrases were selected: Cooperative Groups, Science, Students and Teachers in the Perceptions. I embed the Terms and Phrases of the Experience into the contexts. The analysis starts from the selected coding. I recognize the meaning of the terms and phrase, potentially the elements of the themes.

My perception on cooperative groups is that Cooperative (learning) groups helps to strengthen students using their own strengths while working on their weaknesses, because they get to develop their networking skills, communications skills, and use of academic language as they discuss.

Using cooperative groups allows the teacher to be the facilitator and clarifying misconceptions that would probably be missed if the teacher did not walk around and listen to their discussions and question their thinking as they work on activity.

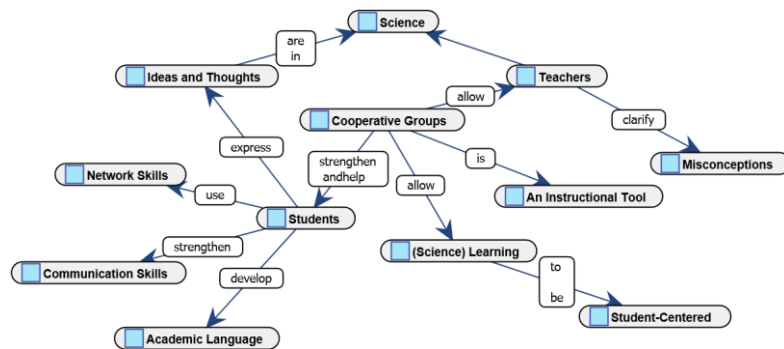
I also use cooperative groups to teach science. By using cooperative groups students can express their ideas, thoughts, and conclusions with others. This helps them elaborate on their thinking and provides for students to converse with one another.

Cooperative groups help students practice not only the academic language but also engage in conversation to practice the English language especially for ELL students.

Cooperative groups provide students to engage in speaking while learning science.

Yes, cooperative groups are a great instructional tool for teachers to use, because the traditional method of instruction where instruction is teacher centered does not always benefit all students.

Using cooperative groups allows the learning to be student centered and for students to be more engaged.



**Figure 4.23: Thematic Graph of PB's Perceptions**

I did an analysis on PB's Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selected codes into the contexts, and then identify three thematic elements: Cooperative Groups, Students, and Science. I believe that these three concepts are central concepts, which can be the elements of the themes.

### **Participant B's Comments and the My Reflection on the Perceptions Data**

Participant B stated in the interview that

My perception on cooperative groups is that Cooperative learning groups helps to strengthen students using their own strengths while working on their weaknesses, because they get to develop their networking skills, communications skills, and use of academic language as they discuss. They also learn to present their findings which helps with their oral presentation in front of others. This develops their presentational skills. Plus, the assigned roles are rotated so that each person will experience each role and not become too comfortable with their roles. Working in groups allows for them to accept others thinking and ideas as well as accepting constructive criticism from others to improve themselves. But most of all, this allows them to communicate and talk. This provides discussion time versus independent seat work. Using cooperative groups allows the teacher to be the facilitator and clarifying misconceptions that would probably be missed if the teacher did not walk around and listen to their discussions and question their thinking as they work on the activity.

Participant B added that

Some benefits include engaging students but also helps them to use their prior knowledge during hands on. This also helps them to better understand the concept before beginning discussion of concepts. For some the hands on activity helps them to make the relevant connection to the classroom activities and discussion.

Some disadvantages are the level of noise. If done correctly students will be discussing the activity if students have too much time on their hands, then this allows for them to lose focus and misbehaviors begin to occur and students are off task. The use of roles and expectations helps to alleviate this issue as well as timing the activity. The timer must be

a constant reminder for students to remain on task as well as holding students accountable for their learning and requiring them to have a product to submit whether a diagram, foldable, chart or exit ticket.

Furthermore, Participant B concluded by stating

I use cooperative groups to teach science. By using cooperative groups students can express their ideas, thoughts, and conclusions with others. This helps them elaborate on their thinking and provides for students to converse with one another. Cooperative groups help students practice not only the academic language but also engage in conversation to practice the English language especially for our ELL students. Cooperative groups provide students to engage in speaking while learning science.

Yes, cooperative groups are a great instructional tool for teachers to use, because the traditional method of instruction where instruction is teacher centered does not always benefit all students. Using cooperative groups allows the learning to be student centered and for students to be more engaged. Cooperative groups are a good teaching tool that may not always be applicable to teaching all content. Teacher must be well prepared, and students must be trained on their expectations during cooperative groups. As with anything the more you know and practice, the better something works.

## **My Reflection**

Participant B's comments on the Perceptions are supplements to the analysis. There is an alignment between the thematic analysis and Participant B's comments. The Thematic Graph as shown in Figure 4.23 represents the association among these themes. For example, "Cooperative Groups" has four connections to other elements. Hence, the "Cooperative Groups" is a dominant theme in Participant B's Perceptions data.

### Participant C's Open Coding Outputs and Descriptions

There were three aspects of the open coding outputs for participant C: Experience, Practice, and Perceptions. Table 4.3 indicates that the Terms and Phrases in Experience are Science, Collaborative, Hands-On and Small Group. The analysis starts from selected coding, where I recognize the meaning of the Terms and Phrases, potentially the elements of the themes.

**Table 4.3**

#### Participant C's Open Coding Outputs

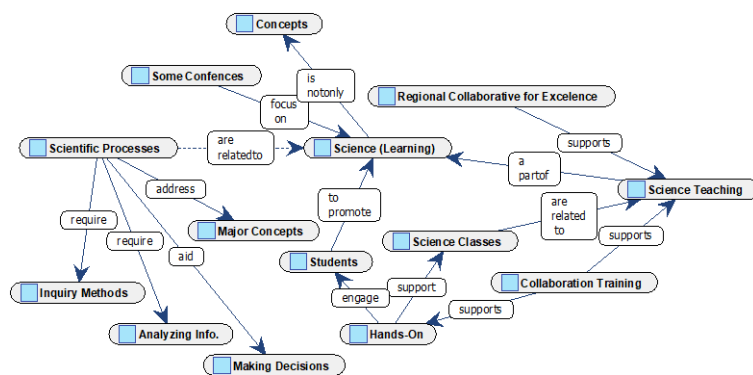
<i>Participant C's Experience Terms and Phrases (Panel A)</i>	
Terms Selected	Phrases Selected
Science, Collaborative	Small groups, Hands-On.
<i>Participant C's Practice Terms and Phrases (Panel B)</i>	
Terms Selected	Phrases Selected
Science, Cooperative	Science, Resources for Science, Cooperative Learning, Science Class
<i>Participant C's Perception Terms and Phrases (Panel C)</i>	
Terms Selected	Phrases Selected
Learning, Students, Cooperative, Science	Cooperative Learning Setting, Learning Community

### **Participant C's Experience**

In the open coding of Participant C's Experience data, several phrases were selected: Science Teaching, Science Learning, Collaboration Training, Science Classes, and Science Processes in Participant C's Experience data. I embed the Terms and Phrases of the Experience into the contexts. The analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrases, potentially the elements of the themes.

1. I have attended several conferences which their main focus is science.
2. I was also part of the Texas Regional Collaborative for Excellence in Science Teaching.
3. Where in collaboration with UTRGV I completed a year of science classes and hands-on experiments.
4. Science is about more than just learning facts and concepts.
5. Hands – on science, I believe engages students and promotes learning.
6. In 5<sup>th</sup> grade, science standards required me to teach planning and safely implement classroom and outdoor investigations using scientific processes,
7. Including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information,
8. While addressing the major concepts and vocabulary in the context of physical, earth and life sciences.

I did an analysis on PC's Experience data as shown in Figure 4.31 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identifies three thematic elements: Science Teaching Science Learning, Collaboration Training, Science Classes, and Science Processes.



**Figure 4.31: Thematic Graph of PC's Experience**

### **Participant C's Comments and My Reflection on the Experience Data**

Participant C claimed that

My total teaching experience is 20 years. Out of those years, I have been teaching science about 14 years. I do feel prepared to teach science. I have taught 5<sup>th</sup> grade for about 8 years. I have attended several conferences which their focus is science. CAST is one conference that I have attended several times, this was a great opportunity where I could take those ideas and implement in my classroom. I was also part of the Texas Regional Collaborative for Excellence in Science Teaching, where in collaboration with UTRGV I completed a year of science classes and hands-on experiments. This partnership also required me to mentor my CADRE group of fifth grade teachers. Another opportunity which I participated in was presenting at the RGVSA at PSJA HIGH, which allowed me to share my experience and knowledge and take what I did in my classroom to groups of different teachers.

Participant C stated that

Cooperative Learning to me means working in small groups, is an instructional strategy in which small groups of students work together on a common task. The task can be as simple

as solving a multi-step math problem together, or as complex as developing a design for a new kind of school. Cooperative learning means sharing ideas and coming up with an end product as a group.

## **My Reflection**

Participant C's comments on the Experience are supplements to the analysis. There is an alignment between the thematic analysis and Participant C's comments. The Thematic Graph as shown in Figure 3.1 represents the association among these themes. For example, "Science Teaching" has four connections to other elements. Collaborative Learning, Hands-On and Science Learning are highlighted as possible thematic elements.

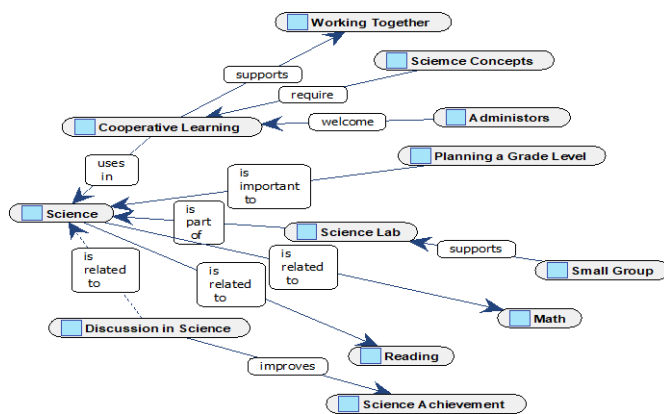
## **Participant C's Practice**

I embed the Terms and Phrases of the Experience into the Contexts.

1. It is very important to plan as a grade level for science or any other subject.
2. My meetings are usually in reading but when we discuss benchmark results, we discuss math and science as well.
3. One of our discussions in science was where or how can we improve our science scores for this year.
4. Our planning and decision were to have small groups (half of class) attending science lab and the other half will work with classroom teacher.
5. Our administrator welcomes the cooperative learning style in science class.
6. After students are taught the main concept in science class, students are given direct instructions on how to complete the lesson cooperatively.

7. After I have the goal for my students, I prepare the different parts of a cooperative activity for my students to work on together.
8. Some of the cooperative learning strategies that my students enjoy doing was working together and researching on a certain topic that they found interesting.

I did an analysis on PC's Practice data as shown in Figure 4.31 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify four thematic elements: Science, Cooperative Learning, Discussion in Science and Science Lab.



**Figure 4.32: Thematic Graph of PC's Practice**

### **Participant C's Comments and My Reflection on the Practice Data**

Participant C stated that

In my position, grade level planning is a very collaborative process. Teachers exchange ideas on how to teach a certain concept and therefore adjust it to their own classroom. Some advantages are the exchange of different ways on how to teach a concept or skill and some challenges are that some teachers are set in their own ways and won't try it.

One way is through discussion on how this will be beneficial for our students. Grade level meetings are weekly and sometimes administrators are in these meetings. My meetings are usually in reading but when we discuss benchmark results, we discuss math and science as well. One of our discussions in science was where or how can we improve our science scores for this year. Our planning and decision were to have small groups (half of class) attending science lab and the other half will work with classroom teacher. Thus, both groups will receive intentional teaching focusing on target growth areas.

Participant C claimed that

After students are taught the main concept in science class, students are given direct instructions on how to complete the lesson cooperatively. Students are given roles and each one in the group is in charge of completing a section of the assignment, but they all are in charge of presenting and understanding all parts of the assignment.

Some of the cooperative learning strategies that my students enjoy doing was working together and researching on a certain topic that they found interesting. Students enjoy finding different aspects of the topic especially on realistic topics such as animals, ecosystems, geography etc. the last part would be presenting on what they learned.

Sometimes you come across a student that resists working in a group. This really hurts your planning because we want to teach our students that by working together, they can learn from each other.

One way that I have overcome this challenge is allowing him/her to work alone and eventually them want to work with a team. Another way that I have overcome this challenge is by asking the student to participate in the group for only a few minutes at a time, eventually the student want to be participating full time in the team activity.

## **My Reflection**

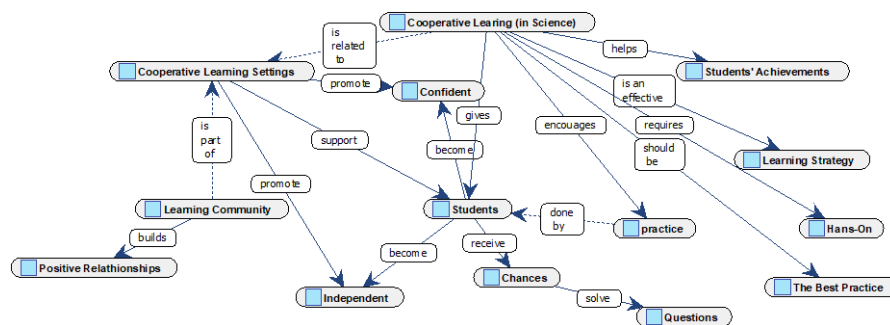
Participant C's comments on the Practice are supplements to the analysis. There is an alignment between the thematic analysis and Participant C's comments. The Thematic Graph as shown in Figure 4.32 represents the association among these themes. Four elements are highlighted: Science, Cooperative Learning, Discussion in Science, and Science Lab. Science has six connections to other elements. Thus, Science is a dominant theme in Participant C's Practice Data.

## **Participant C's Perceptions**

In the open coding of Participant C's Perceptions data, several phrases were selected: Cooperative Learning, Cooperative Learning Settings, Learning Community, and Students in Participant's Perceptions data. I embed the Terms and Phrases of the Experience into the contexts. After that, the analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrases, potentially the elements of the themes.

1. Cooperative learning is very successful when implemented in science. It gives the students an opportunity to discuss and solve the questions asked in a specific activity.
2. Some of the benefits of cooperative learning in science class is that students are doing the actual learning and the actual work.
3. I really can't see any disadvantages of cooperative learning except for that student who tends to be lazy and wait for others to do the work for him.
4. I believe that students begin to learn that they can learn in a cooperative learning setting. They start believing in themselves.
5. I believe that cooperative learning should be implemented in every subject so that students learn to become independent learners.

6. Science should be a lot of hands-on learning. Cooperative learning makes total sense for this class or subject because science class should incorporate a lot of manipulatives, tools and hands on experiments where students can work together to understand the concept.
7. Cooperative learning should be the best practice for student learning. Students should be allowed to research, work together, ask questions and solve problems in a cooperative learning setting.
8. My perspective on cooperative learning is that it is an effective way for students to learn and process information quickly with the help of others.
9. It is essential that each student understands their cooperative learning group role. I believe that if every student does his/her part in this cooperative learning strategy they will both learn from each other and accomplish their common goal.
10. Cooperative Learning helps to: Raise achievement of students.
11. Cooperative learning is very effective when used properly because it involves all students with a common goal.
12. Build positive relationships among students - important for creating a learning community that values diversity.
13. It helps build positive relationships among students and creates a learning community. I believe that students begin to learn that they can learn in a cooperative learning setting.
14. Build positive relationships among students - important for creating a learning community that values diversity.



**Figure 4.33: Thematic Graph of PC's Perceptions**

I did an analysis on PC's Perceptions data as shown in Figure 4.33 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selected codes into the contexts, and then identify four thematic elements:

Cooperative Learning, Cooperative Learning Settings, Learning Community and Students.

### **Participant C's Comments and My Reflection on the Perceptions Data**

Participant C detailed that

I believe that students learn from each other given the right activities and questions for the cooperative target lesson. It is an essential part of learning. Students learn in different ways and one essential way is through hand on learning, most of our students need to see and feel the actual objects to really understand the concept.

Yes, cooperative learning is very successful when implemented in science. It gives the students an opportunity to discuss and solve the questions asked in a specific activity.

Some of the benefits of cooperative learning in science class is that students are doing the actual learning and the actual work. Students need to be able to think through the activity and the solve the questions together. By working together, students have the chance to learn and grow together. I really can't see any disadvantages of cooperative learning except for

that student who tends to be lazy and wait for others to do the work for him. In this case, I would usually separate this student and advise him to do his part or give him his own assignment.

I strongly believe that a student-centered learning environment should and is the best practice for science. In this environment student learn to be independent learners and not wait to be told what to learn from the teacher. In a teacher centered environment the teacher is feeding the information to the students. Students need to learn how to research and become independent learning. Teachers should act as facilitators. I believe that students begin to learn that they can learn in a cooperative learning setting. They start believing in themselves. They learn that their role is vital in completing the task at hand and they are responsible for that part of the project. I believe that students strengthen their social and intellectual skills by communicating and working with each other face to face.

Participant C added that

My perspective on cooperative learning is that it is an effective way for students to learn and process information quickly with the help of others. The goal of using this strategy is for students to work together to achieve a common goal. It is essential that each student understands their cooperative learning group role. I believe that if every student does his/her part in this cooperative learning strategy they will both learn from each other and accomplish their common goal. I would recommend cooperative learning to everyone. Cooperative Learning helps to: Raise achievement of students. Build positive relationships among students - important for creating a learning community that values diversity. Provide experiences that develop both good learning skills and social skills. Cooperative learning is very effective when used properly

because it involves all students with a common goal. It helps build positive relationships among students and creates a learning community.

### **My Reflection**

Participant C's comments are supplements to the analysis. There is an alignment between the thematic analysis and Participant C's comments. The Thematic Graph as shown in Figure 4.33 represents the association among these themes. There are three elements, which are highlighted: Cooperative Learning, Cooperative Learning Settings, and Students. Cooperative Learning has six connections to other elements. Cooperative Learning is a dominant theme in Participant C's Perceptions Data.

### **Participant D's Open Coding Outputs and Descriptions**

Table 4.4 indicates that the Terms and Phrases in Experience data are Science, Cooperative Learning and Small Group in the Experience. The analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes.

**Table 4.4****Participant D's Open Coding Outputs**

<i>Participant D's Experience Terms and Phrases (Panel A)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Cooperative	Cooperative Learning, Small Group
<i>Participant D's Practice Terms and Phrases (Panel B)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science	Materials for Science
<i>Participant D's Perception Terms and Phrases (Panel C)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Groups, Learning, Lab, Science, Cooperative	Cooperative Learning, Science Lab, Small Groups

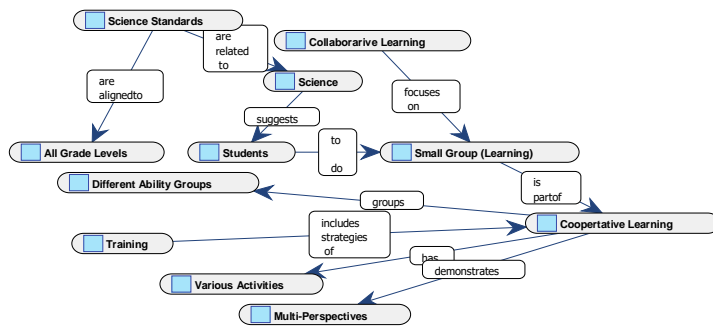
**Participant D's Experience**

I embed the Terms and Phrases of the Experience into the Contexts.

1. Our science standards are aligned to all other grade levels.
2. Dual language for Science. District Science. Make and Take science. Every training mentioned how you can place students in small groups for the activities.
3. Cooperative learning is grouping students by ability.
4. In the training, the showed us how to pair a high student with medium students as well as medium students with low students. I do CIF activities like Jigsaw, shoulder partners, four corners, etc. which all include cooperative learning strategies.

5. Our previous principal assigned us grade level presentations to present lessons or activities on math, reading, and writing. So that helped because we got to see various perspectives and activities on cooperative learning.
6. Collaborative Learning lets me focus on small groups rather than all students at the same time.

I did an analysis on PD's Experience data as shown in Figure 4.41 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements: Collaborative Groups and Cooperative Learning and Small Group Learning.



**Figure 4.41: Thematic Graph of PD's Experience**

### Participant D's Comments and My Reflection on the Experience Data

Participant D specified that

Well, cooperative learning is grouping students by ability. As a teacher, I feel it works but cannot do it all the time. CL lets me focus on small groups rather than all students at the same time. With assigned roles, they have individual responsibility and they like leadership roles. It moves students from medium to high in most if not all cases. You see the progression in all students. Those that are my strugglers mostly if not always move from low to medium. Those

that are medium move to the high group. So, those that are high usually get frustrated especially with the mediums. What helps is that you must see their interests and use it to your advantage. They want to be more independent.

Yes, Cooperative Learning has its challenges, but I went to a district dual language training, and they demonstrated how to put students in groups. It was the best thing! By placing high students with medium students, I see they grasp content faster. By placing medium students with low students, you see that the low students are willing to try new things and that is where you start seeing the progress. After that training, I mentioned it to the grade level, and they started applying it as well. Some of our hesitant in our ways until we try it. I have six groups this year and it works very well.

Yes, I have been trained. One method was to group the students in fours. In each group there would be two mediums, one high, and low student. This method was so that the mediums will grow with the help of the high student and the low student with the help of the mediums.

In the training, the showed us how to pair a high student with medium students as well as medium students with low students. I do CIF activities like Jigsaw, shoulder partners, four corners, etc. which all include cooperative learning strategies. That's why I used student roles so each can know their duty and responsibility to the group. I have also attended and conducted cooperative learning trainings. Our previous principal assigned us grade level presentations to present lessons or activities on math, reading, and writing. So that helped because we got to see various perspectives and activities on cooperative learning.

## **My Reflection**

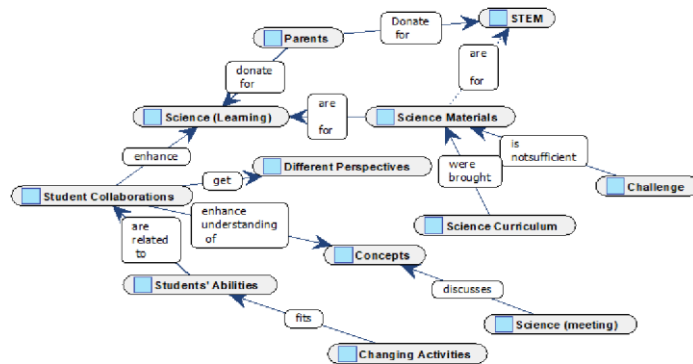
I did an analysis on PD's Experience data as shown in Figure 4.41 and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant D's statement. The first step of the analysis is to embed the selective codes into the contexts, and then identify four thematic elements: Collaborative Groups and Cooperative Learning, Science Standards, and Small Group Learning. Cooperative Learning has five connections to other elements. Science Standards has four links. Hence, Cooperative Learning and Science Standards are two dominant themes in Participant D's Experience data.

## **Participant D's Practice**

In the open coding of Participant D's Practice data, several phrases are selected: Student Collaborations, Science Learning and Science Materials. I embed the Terms and Phrases of the Practice into the contexts. The analysis starts from the selected coding, where I recognize the meaning of the terms and phrases, potentially the elements of the themes.

1. During the science meeting, we discuss concepts that are coming up. We differentiate instruction to reach all students.
2. Some challenges would be not having all the materials for science experiment.
3. We ask parents for donations used for STEM and science.
4. We try and change our activities constantly depending on our students' abilities.
5. They (Student) collaborated and got different perspectives from others.
6. Grade level planning in 5<sup>th</sup> grade is a lot of teamwork. We each bring materials for science curriculum and our journal.

7. During science meeting we discuss concepts that are coming up.
8. We each bring materials for science curriculum and our journal.



**Figure 4.42: Thematic Graph of PD's Practice**

I did an analysis on PG's Practice data as shown in Figure 4.42 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements: Student Collaborations, Science Learning and Science Materials.

### **Participant D's Comments and My Reflection on the Practice Data**

Participant D stated that

Grade level planning in 5<sup>th</sup> grade is a lot of teamwork. We each bring materials for science curriculum and our journal. Mrs. Gonzalez brings more. We take notes on our planning. Example. Monday-Introduction. Tuesday-Independent work. Wednesday-Group Act. Thursday-continue group work or add another. Friday-assessment, multiple choice from curriculum. When necessary, we add a rubric.

We plan for at least 1-2 Activities. We all give input. We plan for at least one video, one activity, and one writing. We work together to come up with a plan. We're very fortunate to

have a great team. Any challenges that may arise is overcome by talking through it. Or take some space and back to working. Do, what works for you.

Every Monday during our conference. Every other week twice a week for math and science.

During science meeting we discuss concepts that are coming up. We differentiate instruction to reach all students. We have rotations to differentiate learning. Each group has something different to work on. Teacher meets with all groups from high to low.

Before students are given an introduction as to what is being taught, they are given instructions and assigned roles like timer, supplier, note taker, etc. After given directions, the teacher facilitates and ensures that all students and groups are working well together and making connections.

Participant D added that

Some challenges would be not having all the materials for science experiments.

Kinesthetic learners don't get the stimulation necessary to make connections. We ask parents for donations used for STEM and science. The district also provides but it's rare.

We also register for free stuff like NASA and Scholastic. We also get Storyworks

Magazines, Foss kits from the district but items used need to be replaced like sticks, sand,

etc. I also buy my own stuff too about 25-50 dollars' worth. The principal also gives us

stuff but not enough. Money determines whether we do it or not. So, we look for an

alternative like asking the students or parents. We also got a 500-dollar grant for the

butterfly garden and the garden club. Kids participate in planting plants in the garden too.

## **My Reflection**

I did an analysis on PD's Practice data as shown in Figure 4.42 and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the

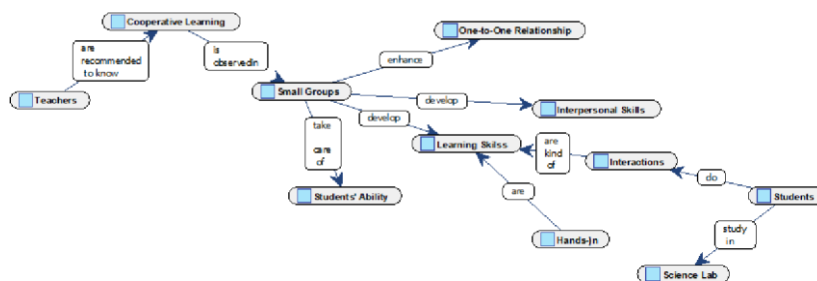
analysis results and Participant D's statements. The first step of the analysis is to embed the selective codes into the contexts, and then identify three thematic elements: Students Collaboration, which has four connections to other elements; Science Learning, which has three connections to other elements; and Science Materials, which has four connections to other elements. I determine that these three thematic elements can be the dominant themes in Participant D's Practice data.

### **Participant D's Perceptions**

In the open coding of Participant D's Perceptions data, several phrases are selected: Small Groups, Cooperative Learning and Learning Skills. I embed the Terms and Phrases of the Perceptions into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes. Embedding the Terms and Phrases of the Experience into the Contexts.

1. Students are placed in groups based on their ability.
2. Skills come in when students are working in small groups because it improves their interpersonal skills.
3. Skills come in when students are working in small groups because it improves their interpersonal skills. Face to face comes in when students practice this interaction with small groups of people and enforces one to one relationship with peers.
4. Observe teachers to get a true insight on cooperative learning.
5. I strongly recommend cooperative learning for teachers.
6. In science lab, our students sometimes teach each other which is great to observe.
7. "Hands-on" science works wonders and should be encouraged.

8. Give them my input, provide experiences, provide your knowledge, and gains. Also, observe teachers to get a true insight on cooperative learning.
9. I strongly recommend cooperative learning for teachers. This strategy is what I've seen been an effective instrument in my classroom.
10. Skills come in when students are working in small groups because it improves their interpersonal skills. Face to face comes in when students practice this interaction with small groups of people and enforces one to one relationship with peers.



**Figure 4.43: Thematic Graph from PD's Perception**

I did an analysis on PE's Perception data as shown in Figure 4.43, and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements: Small Groups, Cooperative Learning and Learning Skills.

## **Participant D's Comments and My Reflection on the Perceptions Data**

Participant D stated that

“Hands-on” science works wonders and should be encouraged. Students learn best when incorporating all areas of learning whether it be kinesthetic, auditory, visual. Students are placed in groups based on their ability.

The struggling learners can gain a better understanding and the highs and mediums are able to increase their learning as well. In science lab, our students sometimes teach each other which is great to observe.

Students compete to be leaders in their groups. Too many leaders do not work in groups.

Students are assigned colors or roles to avoid this. It allows for more physical student engagement. Students are given roles and duties which strengthens interdependence.

Accountability is presented when product is completed. Skills come in when students are working in small groups because it improves their interpersonal skills. Face to face comes in when students practice this interaction with small groups of people and enforces one to one relationship with peers.

### **My Reflection**

I did an analysis on PD's Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant D's statements. The first step of the analysis is to embed the selective codes into the contexts, and then identify three thematic elements: Students Collaboration, which has four connections to other elements; Science Learning, which has three connections to other elements; and Science Materials, which has four connections to other elements. I determine that these three thematic elements can be the dominant themes in Participant D's Practice data.

### Participant E's Open Coding Outputs and Descriptions

Table 4.3 indicates that the Terms and Phrases are Science, Concepts and Cooperative Learning, and Teaching Concept in the Experience. The analysis starts from the selected coding, where I recognize the meaning of the terms and phrase, potentially the elements of the themes.

**Table 4.5**

#### Participant E's Open Coding Outputs

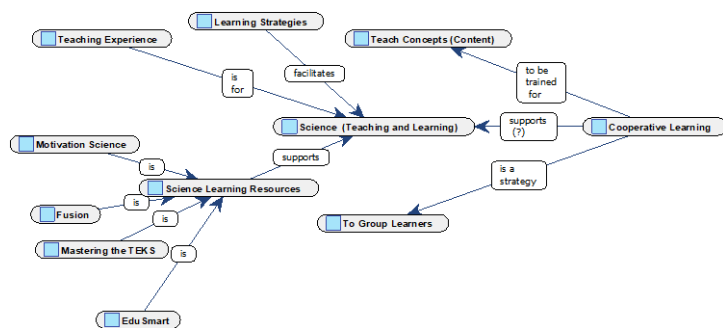
<i>Participant E's Experience Terms and Phrases (Panel A)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Concept and Cooperative	Cooperative Learning, Teach the Concept
<i>Participant E's Practice Terms and Phrases (Panel B)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science	Lab Teacher, Students Are Grouped, Cooperative Learning
<i>Participant E's Perceptions Terms and Phrases (Panel C)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Students Learning Ability Students, Gain Confidence	Cooperative Learning, (lower)

### **Participant E's Experience**

I embed the Terms and Phrases of the Experience into the contexts, and then the analysis starts from the selective coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Experience into the contexts.

1. I have 18 years of teaching, and all have included teaching science.
2. Yes, considering having taught science continuously for many years, I do feel prepared to teach science.
3. Any student can learn science as long as you make it fun and engaging.
4. We have several resources to implement our science standards including, but not limited to, Fusion, Mastering the TEKS, Edusmart, and Motivation Science. They are implemented by us following the lesson and timeline provided.
5. Cooperative learning is as strategy used to group different level of learners to help one another learn a concept.
6. Trainings have been mainly content training with trainers giving you different ideas on how you could use cooperative learning to teach the concept.
7. Our trainings have been district wide trainings at the beginning of the year to go over what is expected throughout the school year. They provide us with certain suggestions on how to teach the concept using cooperative learning.
8. I believe any additional trainings would always help in cooperative learning. It's always best to learn new innovative ways to teach using the cooperative learning method.



**Figure 4.51: Thematic Graph of PE's Experience**

I analyze PE's Experience and summarize the thematic elements. The first step is to embed the selective codes into the contexts, and then identifies three thematic elements: Cooperative Learning, Science (Teaching and Learning), and Science Learning Resources. I believe that these three concepts are central concepts which can be the themes of Participant E's Experience data.

### **Participant E's Comments and My Reflection on the Experience Data**

Participant E added that

I have 18 years of teaching, and all have included teaching science. Yes, considering having taught science continuously for many years, I do feel prepared to teach science. Any student can learn science if you make it fun and engaging.

We have several resources to implement our science standards including, but not limited to, Fusion, Mastering the TEKS, Edusmart, and Motivation Science. They are implemented by us following the lesson and timeline provided, Cooperative learning is as strategy used to group different level of learners to help one another learn a concept. Trainings have been mainly content training with trainers giving you different ideas on how you could use cooperative learning to teach the concept.

I believe any additional trainings would always help in cooperative learning. It's always best to learn new innovative ways to teach using the cooperative learning method.

### **My Reflection**

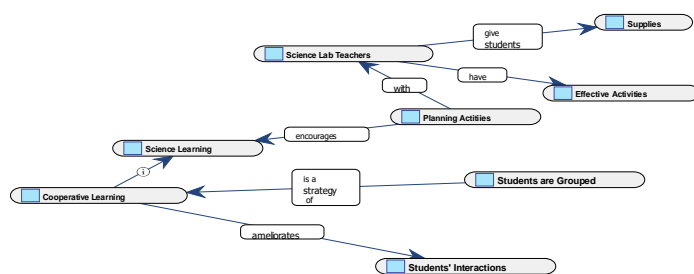
I did an analysis on PE's Experience data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant E's statements. The first step of the analysis is to embed the selected codes into the contexts, and then identify three thematic elements: Cooperative Learning, which has three connections; Science (Teaching and Learning), which has three connections; and Science Learning Resources, which has four connections to other elements. I believe that these three concepts are central concepts which can be the themes of Participant E's Experience data.

### **Participant E's Practice**

I embed the Terms and Phrases of the Practice into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the terms and phrases, potentially the elements of the themes.

1. We spend about an hour to plan activities for science that are fun and engaging so that the students are excited to learn about science.
2. Planning together with our science lab teacher is very important so that we don't duplicate the activities and we can provide additional activities. It also helps to piggyback ideas off one another.
3. They are expected to sit patiently until the lab teacher is ready while the lab teacher gets the supplies ready to pass out.

4. Before implementing cooperative learning instruction, I have to make sure that my students are grouped according to plan.
5. Some cooperative learning strategies that have helped the students is having assigned roles. This allows students to ask one another first before depending on the teacher.
6. In order to prepare, I make sure my students are grouped according to their ability and then I am able to decide what kind of activity I need for them.



**Figure 4.52: Thematic Graph from PE's Practice**

I analyze PE's Practice and summarize the thematic elements. The first step is to embed the selective codes into the contexts, and then identify three thematic elements as shown in Figure 4.52: Science Lab Teacher and Cooperative Learning. I believe that these three concepts are central concepts which can be the elements of the themes.

### **Participant E's Comments and My Reflection on the Practice Data**

Participant E claims that

I spend about an hour to plan for the week and continue throughout searching for new ideas throughout the week. We spend about an hour to plan activities for science that are fun and engaging so that the students are excited to learn about science.

I tend to research daily possible new idea to teach the concepts. I do this will all concepts since I feel new ideas are always being sought out to make things different for the students. Planning together with our science lab teacher is very important so that we don't duplicate the activities and we can provide additional activities. It also helps to piggyback ideas off one another.

We overcome challenges by being open to suggestions from one another. We spend about one day every 2 weeks with administrators planning for science. When discussing about soil, we let our administrator know what hands-on activities we would be doing, how it correlates to the standards, and what we can do to reteach, if necessary.

Some other challenges can be finding the time to get those supplies or us having to purchase them with our own money. They do come in handy because the students learn from these hands-on activities. If supplies are not provided, we will still do our best to purchase ourselves so the kids can have the experience.

Before implementing cooperative learning instruction, I have to make sure that my students are grouped according to plan. Usually it's a top student, mid student, and low student.

During implementation, I need to facilitate groups to ensure students are helping one another. After implementation, I ensure that the students were able to grasp the concept through and exit ticket.

## **My Reflection**

I did an analysis on PE's Practice data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant E's statements in Practice data. The first step of the analysis is to embed the selected codes into the contexts, and then identify two thematic elements:

Cooperative Learning and Science Lab Teachers. There are two connections to Cooperative Learning and there are three connections to Science Lab Teachers. I believe that these three concepts are central concepts which can be the themes of Participant E's Experience data.

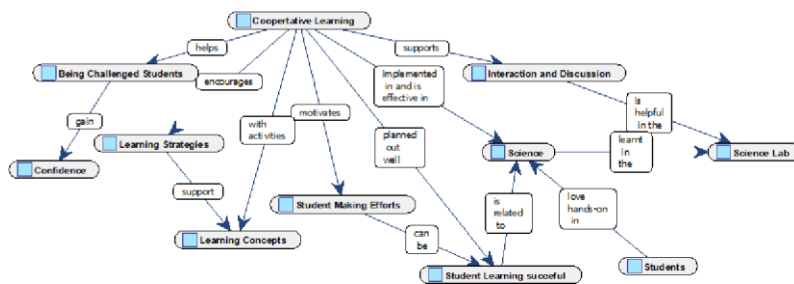
### **Participant E's Perceptions**

I embed the Terms and Phrases of the Perceptions into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the terms and phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Perceptions into the Contexts.

1. Cooperative learning is being implemented in science. The students love working together to answer some of their own questions.
2. My perception is that if cooperative learning is planned out well and you are prepared for the lesson, the students will learn and succeed from it.
3. I believe cooperative learning can work if all students put in an effort.
4. I do recommend cooperative learning since it can work as long as the teacher diligently groups her students in so that all can put in an effort.
5. If used properly, cooperative learning can be effective.
6. Students love hands on science.
7. I do feel that cooperative learning is being implemented in science.
8. Some benefits in both classroom and science lab are that the students learn from one another.
9. My perspective is if students utilize the strategies, they will be successful in learning the concept.

10. Students love hands on science. At the same time, we need to ensure that as they are having “fun”, they are also learning the concept that goes with the activity.
11. I believe cooperative learning can work if all students put in an effort. It will help lower ability students gain confidence as well as help those with higher abilities.
12. Lower ability students also can gain confidence in discussing without being judged.



**Figure 4.53: Thematic Graph of PE's Perceptions**

I did an analysis on PE's Perception data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selected codes into the contexts, and then identify three thematic elements as shown in Figure 4.53: Science, Cooperative Learning and Student Learning Successful. I believe that these four concepts are central concepts which can be the elements of the themes.

### **Participant E's Comments and My Reflection on the Perceptions Data**

Participant E commented that

My perspective is if students utilize the strategies, they will be successful in learning the concept. If they take their roles seriously and can talk with one another to answer questions, they can succeed.

Some benefits in both classroom and science lab is that the students learn from one another.

It could have been something I already taught but sometimes hearing it from their friend enables them to fully comprehend the concept. It also gives confidence to those students who might lack it.

It's a challenge when you find a group that talks too much or tends to have someone who wants or doesn't want to do work. The only way to overcome is by giving them suggestions on how to work together or changing up their group.

I find that students learn more from a student-centered environment. Teachers can give the initial lesson and then give the students the assignments for them to complete cooperatively. I find that students can find it more engaging and therefore, are willing to do their best to learn the concept.

In lab, the student's positive interdependence is strengthened because they learn that they must first try with another to come up with a solution to their problem rather than just turn and ask the teacher. It strengthens their small group skills by allowing them to learn how to work together. Face to face interaction helps them improve their talking skills because they know they need to talk in order to find solutions. The same goes for group processing, in that they learn they have to work together to solve their problems.

My perception is that if cooperative learning is planned out well and you are prepared for the lesson, the students will learn and succeed from it. I believe cooperative learning can work if all students put in an effort. It will help lower ability students gain confidence as well as help those with higher abilities. Assigning roles in these groups will help facilitate everyone doing their part.

I do recommend cooperative learning since it can work as long as the teacher diligently groups her students in so that all can put in an effort. If used properly, cooperative learning

can be effective. Students learn how to work together and discuss ways to find solutions to problems without constantly relying on the teacher. Lower ability students also can gain confidence in discussing without being judged.

### **My Reflection**

I did an analysis on PE's Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant E's statements in Perception data. The first step of the analysis is to embed the selected codes into the contexts, and then identify three thematic elements: Cooperative Learning has seven connections, Science has three connections and Student Learning Successful has three connections. I believe that these three concepts are central concepts, which can be the themes of Participant E's Perceptions data.

### **Participant F's Open Coding Outputs and Descriptions**

Table 4.6 indicates that the Terms and Phrases include Science, Concepts and Cooperative Learning, and Teaching Concept in the Experience. The analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes.

**Table 4.6****Participant F's Open Coding Outputs**

<i>Participant E's Experience Terms and Phrases (Panel A)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Learning Cooperative Activities	Cooperative Activities and Learning Activities
<i>Participant E's Practice Terms and Phrases (Panel B)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Cooperative, Supplies	Cooperative Learning
<i>Participant E's Perception Terms and Phrases (Panel C)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Cooperative	Cooperative Learning, Personal Experiences Prior Knowledge

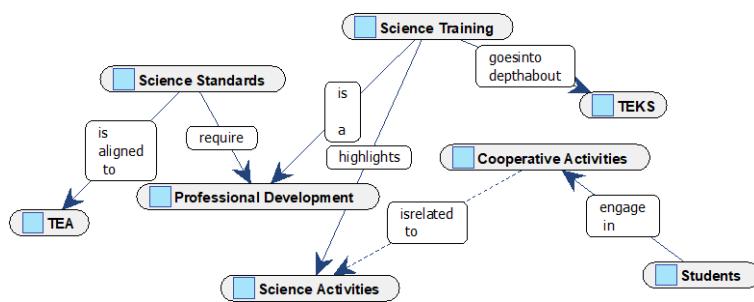
**Participant F's Experience**

I embed the Terms and Phrases of the Experience into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Perceptions into the Contexts.

1. The science standards every year change, either something are added from other grade levels or some are taken away and added to the other grade levels, but everything in science that we teach are aligned to TEA.

2. We also attend Summit K-12 CAST science training. Again, they are similar to the academies but they go a little more into depth about the TEKS and science activities.
3. My perspective is that mostly all activities are relevant to what we already do but also shows us other ways of teaching using cooperative learning activities where students can be engaged and motivated to learn.



**Figure 4.61: Thematic Graph of PF's Experience**

I did an analysis on PF's Experience data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements as shown in Figure 4.61: Professional Development, Cooperative Activities, Science Training and Science Activities. I believe that these four concepts are central concepts which can be the elements of the themes.

### **Participant F's Comments and My Reflection on the Experience Data**

Participant F stated that

I have a bachelor's in education and a master's degree in elementary. I have been teaching 9 years as well as science. Yes, I'm well prepared because after 9 years I feel that I am knowledgeable in all subject areas due to being in the same grade level continuously.

My philosophy for teaching and learning is that all students can learn and succeed if their taught using various teaching methodologies to ignite imagination, curiosity, and motivation in order to get them engaged.

The science standards every year change, either something are added from other grade levels or some are taken away and added to the other grade levels, but everything in science that we teach are aligned to TEA. I define cooperative learning as group work with collaboration to reach the goal of the learning objective.

In the past 3 years I have invested at least 150 hours in science professional development. well, I provided all my training to you and just about all of them include cooperative learning. In reference to science, at the beginning of this year, we had the Science Academies in which we take the TEKS, analyze them, and plan all sorts of cooperative learning activities and implement them. The academies are great! We also attend Summit K-12 CAST science training. Again, they are like the academies, but they go a little more into depth about the TEKS and science activities. My perspective is that mostly all activities are relevant to what we already do but also shows us other ways of teaching using cooperative learning activities where students can be engaged and motivated to learn.

## **My Reflection**

I did an analysis on PF's Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant E's statements in Perception data. The first step of the analysis is to embed the selected codes into the contexts, and then identify three thematic elements: Science Training, which has three connections. Professional Development, which has two connections, and

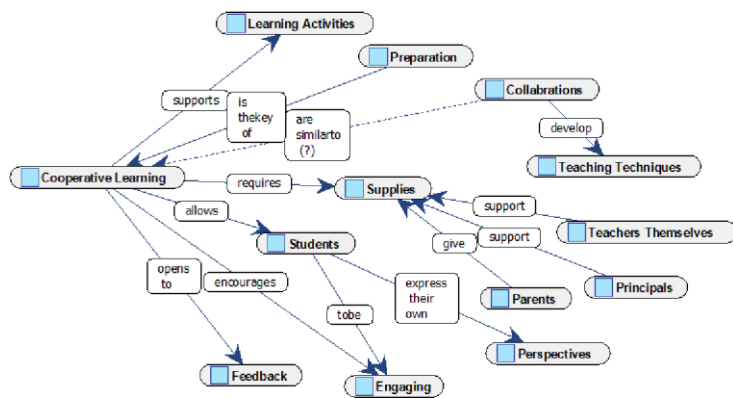
Cooperative Activities, which has three links. I believe that these three concepts are central concepts, which can be the themes of Participant F's Experience data.

### **Participant F's Practice**

I embed the Terms and Phrases of the Practice into the contexts, and then the analysis starts from the selective coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Practice into the Contexts.

1. As a grade level, we meet 3 times a week to collaborate and develop various teaching techniques that can be implemented cooperatively.
2. When we plan, my grade level is cooperative, open to feed back, and collaborative.
3. In a way it does affect implementation of cooperative learning activities, but we find other ways or another activity where the goal is the same but the supplies are different.
4. Cooperative learning is still implemented in just about all activities.
5. My role as a teacher is to be a facilitator and have the students take ownership of their learning through cooperative learning activities using others as well as their perspectives to make their own conclusions in order to add to their prior knowledge making it relevant to their everyday lives.
6. With cooperative learning, preparation is key.
7. I believe cooperative learning makes it more engaging and fun for students to actually get involved in the learning process while teaching each other how to do it.
8. In the beginning of the year, we ask parents to provide supplies that can be used with our lessons like cups, paper plates, straws, glue, etc. we also ask the principal throughout the year if to help us with supplies as well but mostly it comes out of our own pockets.



**Figure 4.62: Thematic Graph of PF's Practice**

I did an analysis on PF's Practice data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements: Cooperative Learning, Supplies and Engaging. I believe that these three concepts are central concepts which can be the elements of the themes.

### **Participant F's Comments and My Reflection on the Practice Data**

Participant F claimed that

Just about every day I dedicate time to additional research because I am always looking for new innovative ideas that will engage students as well as motivate them to learn and uncover other perspectives other than their own to explore them and later apply them. As a grade level, we meet two times a week to collaborate and develop various teaching techniques that can be implemented cooperatively. It is extremely important to plan as a grade level because we all need to be on the same page as to what our goals are and what we want to achieve so we do need that planning time to collaborate and share ideas as we are going along with the TEKS. It is a great way to keep us aligned and prepared to stay on track with the district's timeline.

When we plan, my grade level is cooperative, open to feed back, and collaborative. Those are the advantages. We've learned to work with each other because we all have that same goal of having all students succeed. And of course, the goal is to have all students pass the STAAR, so it is crucial to plan productively and accordingly.

We spend two days a week with administrators discussing and planning. our focus is our progress especially after benchmarks. We discuss what we need to target and what we are going to do to achieve it. Not only do we discuss objectives, but we discuss how we are going to go about it as well as aligning it with our timeline. It does get intense because all the planning we do is based not only on the timeline and the TEKS but our scores. After every meeting, we get out of there thinking about this activity and that activity. I guess all that encourages us to do more brainstorming, more research, and more collaboration because our overall goal is to learn and succeed.

My role as a teacher is to be a facilitator and have the students take ownership of their learning through cooperative learning activities using others as well as their perspectives to make their own conclusions to add to their prior knowledge making it relevant to their everyday lives.

Since we plan weekly, I make sure I have what I need prior to the lessons. That is part of the preparation. With cooperative learning, preparation is key. Sure, it takes time but when you see the lesson in action, student engagement, and collaboration all taking place, it makes it all worth it because there's real learning taking place. Before it all starts, I make sure my supplies and any materials are in place. I explain the objective as well as a brief outline of what is going to take place. I try to clarify any questions before hand.

Throughout the lesson, I continuously guide students to help them achieve the goal

intended. I am there as a facilitator while learning is taking place. Any questions they might have I try to answer or gear them in the right direction on their activity.

After the lesson, each group summarizes what they did and what their conclusion was so that we all can see and hear different perspectives and process of how that was achieved.

So, yes, it is quite intriguing to see how students work together to reach that specific goal.

I believe cooperative learning makes it more engaging and fun for students to get involved in the learning process while teaching each other how to do it. They take pride in their learning because they know they are going to have that opportunity to share it with their classmates.

### **My Reflection**

I did an analysis on PF's Practice data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant F's statements in Practice data. The first step of the analysis is to embed the selected codes into the contexts, and then identify three thematic elements:

Cooperative Learning, Supplies and Engaging. There are seven connections between Cooperative Learning and other elements. Supplies has three connections, and engaging has two connections. I believe that these three concepts are central concepts which can be the themes of Participant F's Practice data.

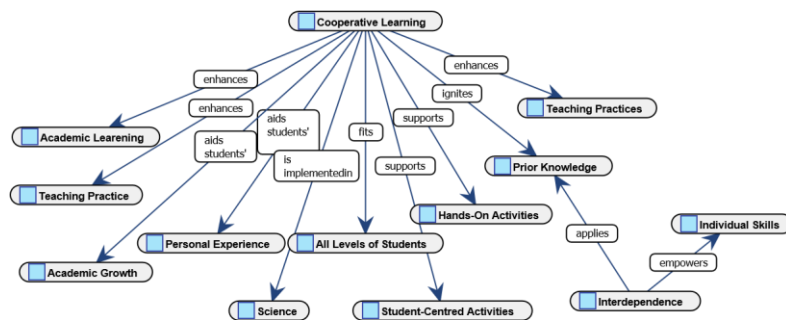
### **Participant F's Perceptions**

I embed the Terms and Phrases of the Perceptions into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the terms and phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Practice into the Contexts.

1. Cooperative learning activities aides in the student's growth academically and their personal experiences.
2. Cooperative learning activities is successfully being implemented in science.
3. The benefit of cooperative learning is that students learn no matter at what level.
4. With student-centered activities, from what I have seen is that students are more motivated and highly driven to learn. Cooperative learning does that and I faithfully use it to teach.
5. My perception about cooperative learning being utilized for teaching practices is that cooperative learning is a method that enhances teaching practices and enhances academic learning and personal experiences.
6. My perception about cooperative learning being utilized in science is that science is more effective when students apply the knowledge to hands on activities and that is when meaningful connections are made.
7. My perception about cooperative learning being utilized in student learning is that cooperative learning ignites the student's prior knowledge that allows them to connect to new content that will allow them to apply it elsewhere in and out of the classroom.
8. I highly recommend cooperative learning for all teachers to implement because helps students learn with various differentiated teaching methodologies that exposes them to other points of view in which helps the students understand the objective and with that, they can apply it elsewhere.
9. My perception about cooperative learning being utilized for teaching practices is that cooperative learning is a method that enhances teaching practices and enhances academic learning and personal experiences.

10. With interdependence, I see that each student takes ownership of their learning when they see everyone else engaged. They also start feeling accountable for how they perform for the group because they take into consideration what other students think and say. They also start applying their prior knowledge with their gained knowledge to empower their individual skills and that's when the application process begins.



**Figure 4.63: Thematic Graph of PF's Perceptions**

I did an analysis on PF's Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements as shown in Figure 6.3: Cooperative Learning, Prior Knowledge, and Interdependence. I believe that these three concepts may be central concepts which can be the themes.

### **Participant F's Comments and My Reflection on the Perceptions Data**

Participant F commented that

My perception about cooperative learning being utilized for teaching practices is that cooperative learning is a method that enhances teaching practices and enhances academic learning and personal experiences.

My perception about cooperative learning being utilized in science is that science is more effective when students apply the knowledge to hands on activities and that is when meaningful connections are made.

My perception about cooperative learning being utilized in student learning is that cooperative learning ignites the student's prior knowledge that allows them to connect to new content that will allow them to apply it elsewhere in and out of the classroom. That is what cooperative learning allows you to do and that is to apply it.

My perspective is that is that group work helps students learn using the views of others to understand what is being taught. Cooperative learning activities aides in the student's growth academically and their personal experiences that can be applicable to their prior experiences. The benefit of cooperative learning is that students learn no matter at what level their own. They still learn. It is for all learners whether they are tactile, auditory, or visual.

## **My Reflection**

I did an analysis on PF's Practice data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant F's statements in Practice data. The first step of the analysis is to embed the selected codes into the contexts, and then identify three thematic elements: Cooperative Learning, Prior Knowledge, and Interdependence. There are seven elements to connect to Cooperative Learning. Prior Knowledge has two connections, and Interdependence also has two connections. I believe that these three concepts are central concepts, which can be the themes of Participant F's Perceptions data.

### Participant G's Open Coding Outputs and Descriptions

There are three aspects of the open coding outputs for participant H: Experience, Practice, and Perceptions. Table 4.7 indicates that the Terms and Phrases include Science, Collaborative, Lab, STAAR. The analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrase, potentially the elements of the themes.

**Table 4.7**

#### Participant G's Open Coding Outputs

<i>Participant F's Experience Terms and Phrases (Panel A)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Collaborative	Science Training
<i>Participant PF's Practice Terms and Phrases (Panel B)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Lab, STAAR,	Science Lab, Model Instructions
<i>Participant F's Perception Terms and Phrases (Panel C)</i>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Collaborative	Collaborative Groups, Skills through Collaborative Groups

## Participant G's Experience

I embed the Terms and Phrases of Participant G's Experience into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the terms and phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Experience into the Contexts.

1. As of 2018, I have been teaching 10 years. Have taught science all 10 years.
2. Science is based on exploration and teachers should facilitate a student's inquiry, create opportunities for hands on and facilitate students' seeking answers to real world questions.
3. Yes, science training using collaborative groups would be beneficial. Yes, because a student might learn better from another student.
4. Our Bing Bang Science – Kinder Science, 5<sup>th</sup> grade curriculum training, K-12 Summit Science training.
5. 5<sup>th</sup> grade teacher; Kinder Collaborative Learning Facilitator.

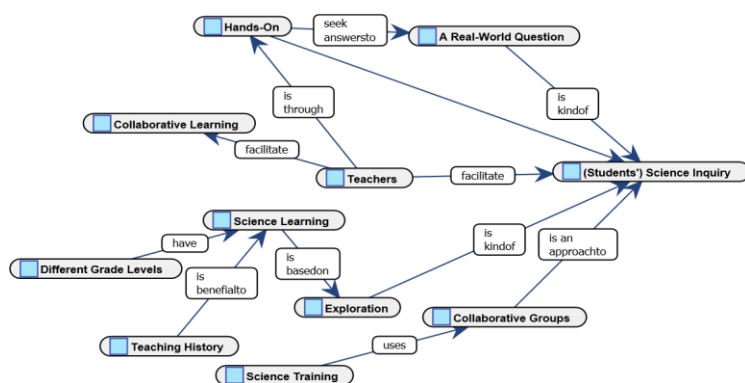


Figure 4.71: Thematic Graph of PG's Experience

I did an analysis on PG's Experience data and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify four thematic elements: Science Inquiry, Science Learning, Collaborative Groups and Hands-On.

### **Participant G's Comments and My Reflection on the Experience Data**

Participant G stated that

As of 2018, I have been teaching 10 years. Have taught science all 10 years. I have two bachelor's degrees in International Business and French: Master's Degree in Bilingual Education specializing in Reading.

Science is based on exploration and teachers should facilitate a student's inquiry, create opportunities for hands on and facilitate students' seeking answers to real-world questions.

5<sup>th</sup> grade standards are organized by 4 categories. Teachers are responsible for teaching readiness standards in all 4 categories, as well as supporting standards. Being able to share, interact and collaborate ideas through listening, speaking, reading and writing to solve problems or accomplish a common goal.

Science training using collaborative groups would be beneficial. I received professional development in Bing Bang Science – Kinder Science, 5<sup>th</sup> grade curriculum training, and K12 Summit Science training.

### **My Reflection**

I did an analysis on PG's Experience data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant G's statements in Experience data. The first step of the analysis is to embed the

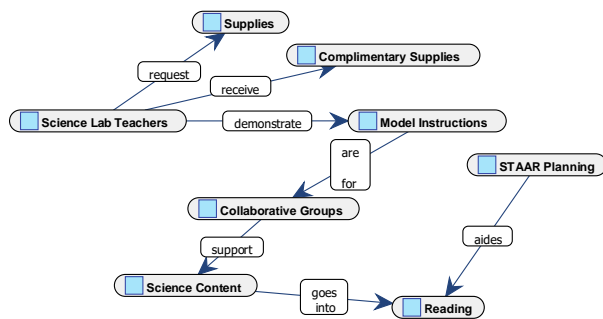
selective codes into the contexts, and then identify four thematic elements: Science Inquiry, Hands-On, Science Learning, and Teachers. There are five elements to connect to Science Inquiry. Hands-On has three connections, Science Learning also has two connections, and Teachers has four links. I believe that these four concepts are central concepts that can be the themes of Participant F's Perceptions of data.

### **Participant G's Practice**

I embed the Terms and Phrases of the Perceptions into the contexts, and then the analysis starts from the selective coding, where I recognize the meaning of the terms and phrases, which are potentially the elements of the themes.

Embedding the Terms and Phrases of the Practice into the Contexts. Science lab teacher asked us in the beginning of the year what supplies we should buy for the science lab.

1. I know our science lab teacher does receive complimentary supplies such as science kits, but I am not aware of the name of the companies.
2. Model instructions for collaborative groups.
3. Reading and Math might sometimes supersede science planning as STAAR is made priority above anything else.
4. When we need to target Reading STAAR planning, we incorporate reading passages with science content.
5. Before – deliver instruction of content, model instructions, questioning. After – questioning on what was learned, discussion with whole class, informal and formal assessments.



**Figure 4.72: Thematic Graph of PF's Practice**

I did an analysis on PG's Practice data as shown in Figure 4.72 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selective codes into the contexts, and then identify three thematic elements: Science Lab Teachers with three connections, Collaborative Groups with three links, and "Model Instructions" has three links.

### **Participant G's Comments and My Reflection on the Experience Data**

Participant G commented that

Weekly teacher planning is great since all teachers in the grade level are open to sharing ideas and willing to implement new ideas in the classroom. We have science in the classroom for 45 minutes, and then have science lab for 45 minutes.

I model instructions for collaborative groups. Before I start, I deliver instruction of content, model instructions, and questioning. Afterwards, I start questioning on what was learned, have discussion with whole class, and conduct informal and formal assessments.

Some students are not particularly fond of working in groups, pairs, or triads. For those students that do not feel comfortable with working in groups, I do not force them but rather encourage them to use whatever strategy works for them. I think the more strategies I

present in class, the better. This way the student individually or in groups can decide what works best for them.

## **My Reflection**

I did an analysis on PG's Practice data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant G's statements in Practice data. The first step of the analysis is to embed the selective codes into the contexts, and then identify three thematic elements: Science Lab Teachers with 3 connected elements; Model Instruction has five links. Collaborative Groups has three links. I believe that these three concepts are central concepts which can be the themes of Participant G's Practice data.

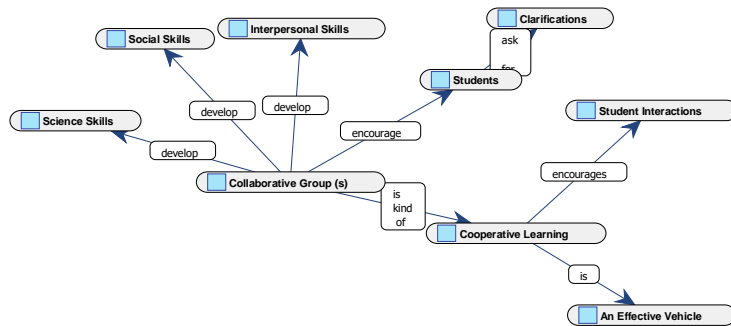
## **Participant G's Perceptions**

I embed the Terms and Phrases of the Perceptions into the contexts, and then the analysis starts from the selective coding, where I recognize the meaning of the terms and phrases, potentially the elements of the themes.

Embedding the Terms and Phrases of the Practice into the Contexts: Interpersonal skills are broadened as social skills are built when having to converse with other people.

1. Adult learning is different from child learning, however, collaborative groups also deepen the understanding of content during teacher trainings.
2. Students are able to build fundamental science skills through collaborative groups.
3. Through collaborative groups, students learn that asking for clarification is okay, something that they might be afraid to ask working individually.

4. Cooperative learning should take place in the classroom in every content for those students who wish to collaborate with their peers.
5. Collaborative learning is effective because it is another approach for a student can learn.



**Figure 4.73: Thematic Graph of PF's Perceptions**

I did an analysis on PF's Practice data as shown in Figure 4.73 and selected the thematic elements from these candidates of Terms and Phrases. The first step is to embed the selected codes into the contexts, and then identify two thematic elements: Collaborative Groups with five connections, and Cooperative Learning with three connections.

### **Participant G's Comments and My Reflection on the Experience Data**

Participant G mentioned that

“Hands-on” activities are a great way to present real-world scenarios. However, procedures and systems must be in place for overall classroom management. Every day in science lab, a collaborative learning activity takes place, and the students enjoy it. Once we get back to the classroom, I question students on the science lab activity and most students seemed to understand the objective.

Students help each other out, students enjoy the lesson more, good discussions take place in groups. Some of the activities require a lot of multi-step instructions. Some students

sometimes get lost in the “fun” and forget the objective of the activity. Student led activities are great for science, but to be successful, proper procedures and systems must be in place. Through collaborative groups, students learn that asking for clarification is okay, something that they might be afraid to ask working individually. Interpersonal skills are broadened as social skills are built when having to converse with other people.

### **My Reflection**

I did an analysis on PG’s Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant G’s statements in Perceptions data. The first step of the analysis is to embed the selective codes into the contexts, and then identify two thematic elements: Collaborative Groups and Cooperative Learning. I believe that these two concepts are central concepts which can be the themes of Participant G’s Perceptions data.

### **Participant H’s Open Coding Outputs and Descriptions**

There are three aspects of the open coding outputs for participant H: Experience, Practice, and Perceptions. Table 4.5 indicates that the Terms and Phrases are learning, teacher cooperative, science and students, cooperative learning grade level, teacher-led instruction, and model expectation in the Experience. The analysis starts from the selective coding, where I recognize the meaning of the terms and phrase, potentially the elements of the themes.

**Table 4.8***Participant H's Open Coding Outputs*

<b><i>Participant B's Experience Terms and Phrases (Panel A)</i></b>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Science, Students	Cooperative Learning, Grade level, Teacher-Led Instruction, Model expectation
<b><i>Participant B's Practice Terms and Phrases (Panel B)</i></b>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Learning, Cooperative Science	Cooperative learning
<b><i>Participant B's Perception Terms and Phrases (Panel C)</i></b>	
<b>Terms Selected</b>	<b>Phrases Selected</b>
Students, (Student-Centered) Learning	0

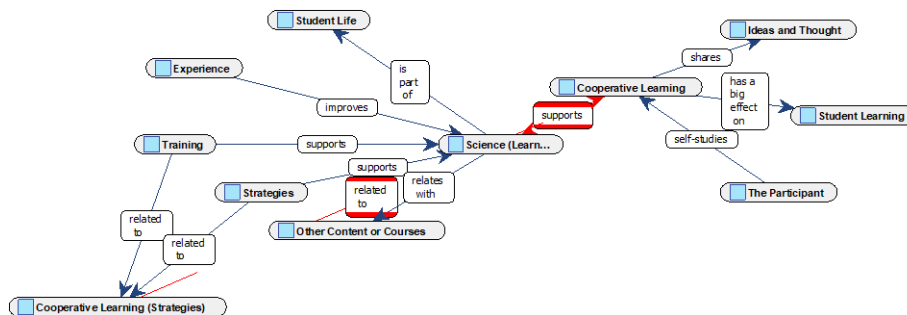
**Participant H's Experience**

I embed the Terms and Phrases of the Experience into the contexts, and then the analysis starts from the selected coding, where I recognize the meaning of the Terms and Phrases, potentially the elements of the themes.

Embedding the Terms and Phrases of the Experience into the Contexts.

1. Two years (of teaching) include science as a new teacher, I am still learning and feel that I could use more training, strategies, and experience to say that I am well prepared.

2. I believe that science is a crucial part of a student's life and it's important that they experience and learn for life.
3. Science (a course/classroom) is spent 45 min focused on science (a subject matter), however it is incorporated throughout the day in other lessons as it relates with other core contents.
4. Cooperative learning to me is sharing ideas, thoughts and learning from one another and see different perspectives.
5. I believe cooperative learning when done correctly can have a big impact on student learning.
6. I have not specifically been trained to target cooperative learning, I have however enabled to observe others using cooperative learning and then applied it in my classroom.



**Figure 4.81: Thematic Graph of PH's Experience**

I recognize the thematic elements from Participant H's statement in the Experience. The first step is to embed the selected codes into the contexts, and then identify some thematic elements as shown in Figure 4.81: Science (Learning), Cooperative Learning and Cooperative Learning Strategies.

## **Participant H's Comments and My Reflection on the Experience Data**

Participant H stated

I have taught 2 years of 5<sup>th</sup> grade and summer school 3<sup>rd</sup> grade. I have a Bachelor's degree in Social Work. As a new teacher, I am still learning and feel that I could use more training, strategies, and experience to say that I am well prepared.

Cooperative learning to me is sharing ideas, thoughts and learning from one another and see different perspectives. I believe cooperative learning when done correctly can have a big impact on student learning. I have not specifically been trained to target cooperative learning, I have however been able to observe others using cooperative learning and then applied it in my classroom. As a second-year teacher I do believe that I could benefit from having ongoing training in this particular area, there are so many styles that have been proven successful for experienced teachers and it would be beneficial for new teachers to learn them.

### **My Reflection**

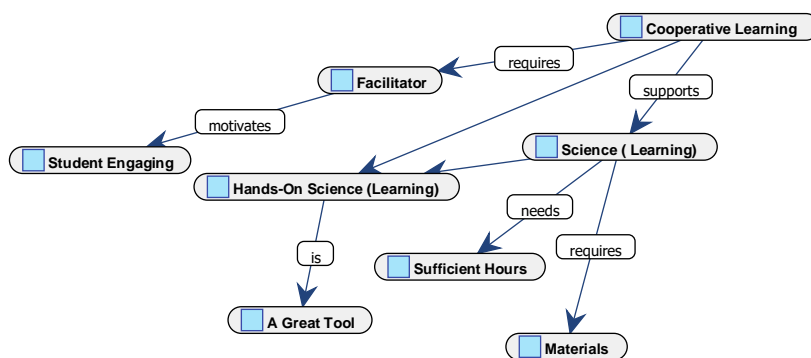
I did an analysis of PH's Experience data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant H's statements in Experience data. The first step of the analysis is to embed the selective codes into the contexts, and then identify three thematic elements: Science (Learning), Cooperative Learning, and Cooperative Learning Strategies. I believe that these concepts are central concepts, which can be the themes of Participant H's Experience data.

## Participant H's Practice

I embed the Terms and Phrases of the Experience into the contexts, and then the analysis starts from the selective coding, where the I recognize the meaning of the terms and phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Practice into the contexts.

1. My role changes as a facilitator while students engage in cooperative learning, and after it is teacher –student led discussion on what we learned.
2. Approximately 2 ½ hours, science is probably the least amount of time that is given, approximately 45min.
3. As a grade level we do decide what materials we would need for science, at times we are given supplies that have already been chosen for us.
4. I think hands on science is great tool for learning, student become more engaged in activities when they are able to apply what they have learned.



**Figure 4.82: Thematic Graph of PH's Practice**

I did the semantic analysis, and recognizes the thematic elements from Participant H's statement in the Practice. The first step is to embed the selective codes into the contexts, and then identifies four thematic elements: Cooperative learning, Hands-On Science (Learning), and Science.

### **Participant H's Comments and My Reflection on the Practice**

Participant H stated that

Grade level planning is always beneficial for me as a new teacher, ideas are always shared, and veteran teachers can share their strategies and develop new ones. Grade level will work together to find solutions, ideas are shared, critical constructive criticism is given, feedback always welcomed.

Before instructions students will be given clarity on content, discuss any prior knowledge they may have or ask questions before starting. After directions students are responsible for their learning from their peers.

I think it is beneficial for them because they are able to get clarity on questions they had regarding the content. I think hands on science is great tool for learning, student become more engaged in activities when they can apply what they have learned. I think that when you implement it correctly and consistently incorporate it into daily lesson it can be highly successful. Sharing ideas, working together, collaborating, engaged in lesson, shared learning, and build confidence in students.

### **My Reflection**

I did an analysis of PH's Practice data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and

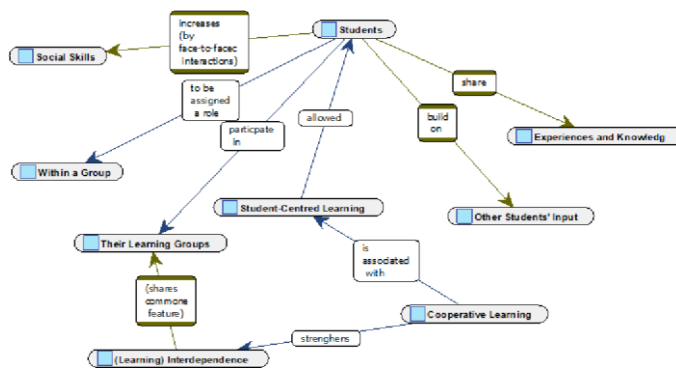
Participant H's statements in Practice data. The first step of the analysis is to embed the selected codes into the contexts, and then identify three thematic elements: Hands-On Science (Learning), Cooperative Learning and Science. Hands-On Science Learning has three connections, Cooperative Learning has three connections, and Science has three connections. I believe that these three concepts are central concepts that can be the themes of Participant H's Practice data.

### **Participant H's Perceptions**

I embed the Terms and Phrases of the Perceptions into the contexts, and then the analysis starts from the selective coding, where I recognize the meaning of the terms and phrase, potentially the elements of the themes.

Embedding the Terms and Phrases of the Practice into the contexts.

1. I think you must know your students and assign roles within the groups, so everyone is responsible for their learning and contributing to the group.
2. Student centered learning allows students to participate in their learning and shifts the responsibility to themselves.
3. Cooperative learning could strengthen student interdependence because everyone contributes to the group and gives accountability for that student to share input to group.
4. Student face to face interaction also allows social skills among peers to build confidence.
5. I think if it is done correctly, it can be effective, students build on other students' input and share their experiences and knowledge.



**Figure 4.83: Thematic Graph of PH's Perceptions**

As shown in Figure 4.83, I recognize the thematic elements from Participant H's Perceptions data. The first step is to embed the selected codes into the contexts, and then identify some thematic elements: Students, Cooperative Learning, Learning Groups and Learning in Interdependence.

### **Participant H's Comments and My Reflection on the Perception Data**

Participant H stated that

Grade level planning is always beneficial for me as a new teacher, ideas are always shared, and veteran teachers can share their strategies and develop new ones. Grade level will work together to find solutions, ideas are shared, critical constructive criticism is given, feedback always welcomed.

Before instructions students will be given clarity on content, discuss any prior knowledge they may have or ask questions before starting. After directions students are responsible for their learning from their peers.

I think it is beneficial for them because they are able to get clarity on questions they had regarding the content. I think hands on science is great tool for learning, student become more engaged in activities when they can apply what they have learned. I think that when

you implement it correctly and consistently incorporate it into daily lesson it can be highly successful. Sharing ideas, working together, collaborating, engaged in lesson, shared learning, and build confidence in students.

## **My Reflection**

I did an analysis on PH's Perceptions data and selected the thematic elements from these candidates of Terms and Phrases. There is an alignment between the analysis results and Participant H's statements in Perceptions data. The first step of the analysis is to embed the selected codes into the contexts, and then identify four thematic elements: Students with six connections, Cooperative Learning with two connections, Learning Groups with two connections, and Learning in Interdependence with two connections. I believe that these four concepts are central concepts that can be the themes of Participant H's Perceptions data.

## **Coding Structure**

Utilizing grounded theory, the open coding method was the comprehensible process by which codes to the collected material and knowledge are fastened during qualitative data analysis. Open coding is reached by piecing data into substantial representations and explaining them in precise words to brief chronological sequences of vital words. In my qualitative research, it made it easier to clarify the responses received during the interviews of each participant. By assigning a code word or phrase, it helped me examine and review the findings. Open coding connected Grounded Theory to the interviews conducted. This organization initially aided in the interpretation, analysis, and categorization of each.

In addition, in conjunction with grounded theory and open coding, selective coding was climaxed to adjust another theory based on the investigation. After developing one core category,

other categories are rooted in that core. Its purpose was to tie in all coding categories and subcategories together to depict a grand theme. The grand theme conveyed overall the reason why this qualitative research was pursued and for others to continue. The grand theme portrayed a message for all the educational community and beyond to acknowledge.

In thematic coding or analysis, the qualitative data was explored by analyzing the value of words and phrases. Thematic coding was used to analyze data by discovering and/or uncovering the topics that are most common in interview responses. The theme is a grand idea that occasionally is repetitive. The grand theme typically discovers and/or uncovers what the work was about and was beneficial in the development of perceptions and/or evaluations. Conversely, the interviews were used to identify what others are similarly stating or how their own experiences, practices, and perceptions are associated with other interviewees. The thematic coding provides researchers with a chance of bringing the themes to a theory, which can be generalized to explain more data with the potential data saturation. Such a theoretical leap is also a key point of grounded theory.

As a tree roots out further down into the ground so does the growth of Sub-construct coding. After Open coding, Selective coding, and Thematic coding are created and analyzed, Sub-construct coding categories are further analyzed to obstruct and uncover additional and precise details that are broken down into sub-groups. Sub-groups aided in the understanding of the research theme. The details transmit ideas and perceptions of others to others. The whole purpose is to comprehend what was said, written, and interpreted.

One coding I would create is Perceptual coding. It is one I would use to just entail what others think. Perceptual coding would pinpoint the commonalities of phrases or words amongst the participants only. This step can be a coding process used only for people's thoughts and perceptions. What people think and/or how interpret can better help us as researchers understand

their views or actions. Perceptual coding will be coding used to go deeper into people's thoughts and views. The purpose is to understand the participants in the research.

Overall, what I got from Open coding was that to better understand a topic or theme it must be broken down further to better understand the research. The codes aid in accelerating the researcher's thinking process of the research. When that is achieved, those codes can later be placed into categories that help determine the general theme being produced by the data collection. Uncovering the hidden patterns amongst the categories can aid in the overall production of the storyline or theme being discovered. The uncovered patterns also aid in finding other solutions that might work best for the research or to locate common challenges. When exploring solutions or challenges helps in developing a relationship to better come up with solutions to solve the problems by reaching the solution with fine accuracy. That is why when patterns are uncovered it is crucial to recognize the concept precisely. Understanding is a key element in tying it all to Grounded Theory. Grounded Theory just puts all this coding into perspective to completely link the data analysis to the solution and challenges of the research problem. Once linking Grounded Theory with coding, it becomes a tool to be utilized for creating solid support and profound perceptions.

### **Summary**

The purpose of this case study identifies the teachers' perception, experience, and practice of the implementation of cooperative learning. Eight semi-structured interviews were conducted. The eight participants varied in their perception, experience, and practice. The participants answered the research questions about their perception, experiences, and practice with cooperative learning implementation as well as its challenges and benefits. The set of questions served as a guide for the research but was without constraints on teacher opinions too.

Cooperative learning is viewed by the participants as a teaching tool to provide differentiated instruction when teaching science. It offers students a learning experience they have when they work cooperatively and collaboratively in small groups. The teachers see first-hand how students' problem solve, communicate, collaborate, and share each other's perspective. Some teachers stated that when they implement cooperative learning students have roles. Roles help students take control of their individual learning. The teacher is simply the facilitator. The teachers all agreed that it does take planning time to prepare the lessons since they do require teachers' materials to be gathered and organized. It may sometimes be challenging since no materials are available, so lessons must be altered, but the objective is still the main goal to achieve. Most teachers if not all have the experience to implement cooperative learning. With detail planning, they feel confident they can be successful in the implementation of cooperative learning. Most have had professional development training that entailed cooperative learning implementation; hence, they feel assured to demonstrate to those with lesser teaching experience how it's implemented. So even if they have not received professional development in cooperative learning, they get the "training" if you will from their fellow colleagues.

Research participants see cooperative learning as beneficial to students based on the interview statements. They see student progress take shape as they work cooperatively in small groups. Sharing their perspectives during their small groups can form new perspectives when they combine them with their prior knowledge. Teachers agree that cooperative learning provides a positive classroom climate. It is all student-centered making cooperative learning more motivating and engaging for students of all learning levels. When implementing cooperative learning, the goal is not only to achieve the learning objective successfully but to reach all learners. Even though cooperation takes time in the planning stage, they see the cognitive and social benefits in students, making it well worth the time and effort put into it. Observing the

students actively involved in cooperative learning establishes the positive impact students respond to when communicating, problem-solving, and engaging in the lesson.

Overall, the eight participants have a positive perspective toward cooperative learning implementation. Even though it requires time for planning and gathering materials, they find it rewarding and beneficial for all learners. Student-centered teaching is focused on student learning and student academic achievement. Implementing cooperative learning requires teacher commitment to effectively implement cooperative learning.

## CHAPTER V

### SUMMARY AND CONCLUSION

This study examined the data collected by interviewing eight participants who were elementary teachers. The data were prepared in three aspects: Experience, Practice, and Perceptions of cooperative learning and science education. The interview data were finally recorded in transcripts.

Open coding was the first step in the study. The Data Exploration and Visualization (JMP, 2022) reported the frequencies of both Terms and Phrases. This is a straightforward method to inform the researcher what are Terms and Phrases mostly occurs in the interview transcripts. The term is a crucial concept, and the Phrase consists of two/more Terms. The frequencies of the Terms and Phrases only provide hints that they are possibly the important blocks in the analysis. However, it cannot be determined that they should be the elements entering the next level of the analysis. The theory and framework of the analysis did not support some words in the study such as many these or ands. Some words were very common and widely used in the interviews. The analysis considers the words in the context, but it cannot provide meaningful information related to the themes and even advanced blocks. Even though the Text Explorer of JMP reported a term or phrase with relatively higher frequencies, they may not be selected to be the elements in the open coding. Hence, Table 4.1—Table 4.8 listed the elements that were selected in the open coding analysis. There were three aspects: Experience, Practice, and Perceptions, where both

Terms and Phrases are included. Thus, we may see that it is not always the same elements selected in the open coding as the ones in the Thematic Graphs via a Semantic Analysis.

Thematic analysis was based on the elements selected from the open coding, which was a leap. Though the statements of the interviews have already contained the Terms and Phrases that we may want to highlight, they were still cryptic and isolated from each other. A metaphor was that we needed a road map when we drove on our way. The connections between towns aid in knowing additional information about these towns and their stories of the towns. We also know a graphical representation is better than only reading the texts. “A picture is worth a thousand words.” In the data analysis of educational and social sciences, semantic analysis played such a role and we can visualize the Terms, Phrases, and relationships among them. Of course, we need aid in the context of the sentences and paragraphs.

Semantic analysis and semantic network analysis (MDM, 2023) allow knowing the logic and semantic relationships among the Terms and Phrases. For example, as shown in Figure 4.62 (p. 129), Cooperative Learning has ten connections, which meant at least it was related to these ten concepts. The detailed analysis may require me to embed it into contexts, such as a sentence or a paragraph.

## **Thematic Elements and Themes**

### **Recapping Themes**

We need a summary of the thematic elements or themes across eight participants and three aspects: Experience, Practice, and Perceptions. I want to clarify that such analyses are worthy of discussion. However, at least, the analysis and analytical processes provide us with a framework for mapping from the data to the theme.

**Recapping Themes of Experience.** As shown in Table 5.1, the thematic coding of Experience indicates that Cooperative Learning is a dominant theme. Further, the themes can be classified into three categories: strategies, content, and recourses. The details have been shown as followings. Related to the strategies of Cooperative Learning, I want to share that several themes: Professional Development, Instructional Strategy, Collaborative Training, Collaborative Groups, Small Groups, Cooperative Activities, and Hands-On. Related to the content, there are several themes: Reading, Teaching Concepts, Content of Science, Science (Teaching and Learning), Science Training, Science Processes, and Science Inquiry. Related to the resources: Science Learning Resources.

**Table 5.1**

**Summary of the Thematic Elements and Dominant Themes in Experience**

Participant	Themes in Experience
PA	Professional Development, Teaching Concepts, Cooperative Learning, and Collaborative Learning of Reading.
PB	Cooperative Learning, Instructional Strategy, Comprehension of Concepts, and Content of Science.
PC	Science Teaching. Science Learning, Collaboration Training, Science Classes, and Science Processes.
PD	Collaborative Groups, Cooperative Learning, and Small Group Learning.
PE	Cooperative Learning, Science (Teaching and Learning), and Science Learning Resources.
PF	Science Training, Professional Development, and Cooperative Activities.
PG	Science Inquiry, Hands-On, Science Learning, and Teachers.
PH	Science (Learning), Cooperative Learning, and Cooperative Learning Strategies.

**Recapping Themes of Practice.** As shown in Table 5.2, the thematic coding of Practice indicates that there are five participants who mentioned Cooperative Learning, and I suggest that Cooperative Learning is a dominant theme. Related to the strategies of Cooperative Learning, I want to share that several themes are in these categories: Hands-On Activities, Collaborative Groups, Engaging, Discussion in Science, and Student Collaboration. Related to the content, there are several themes: Science Standards, Science, Related to the resources: Science Lab, Science Materials, Science Learning Sources, and Supplies.

**Table 5.2**

**Summary of the Thematic Elements and Dominant Themes in Practice**

Participant	Themes in Practice
PA	Cooperative Learning, and Science Lab.
PB	Hands-On Activities, Cooperative Groups, Science Lab Teachers, and Science Standards.
PC	Science, Cooperative Learning, Discussion in Science, and Science Lab.
PD	Students Collaboration, Science Learning, and Science Materials.
PE	Science (Teaching and Learning), Science Learning Resources, and Cooperative Learning.
PF	Cooperative Learning, Supplies, and Engaging.
PG	Science Lab Teachers, Model Instruction, and Collaborative Groups.
PH	Hands-On Science (Learning), Cooperative Learning, and Science.

**Recapping Themes of Perceptions.** Related to Cooperative Learning, I want to share that there are several themes: Collaborative Learning, Science Learning, Learning in Interdependence. Related to the strategies of Cooperative Learning, that several themes: Cooperative Learning Strategies, Cooperative Groups, Collaborative Learning, Hands-On; Small Groups, Learning Skills and Collaborative Groups Related to the content: Science, Prior knowledge, and Science Teaching.

**Table 5.3**

**Summary of the Thematic Elements and Dominant Themes in Perceptions**

Participant	Themes in Perceptions
PA	Cooperative Learning Strategies
PB	Cooperative Groups, Students, and Science
PC	Science Teaching, Collaborative Learning, Hands-On, and Science Learning
PD	Small Groups, Cooperative Learning, and Learning Skills.
PE	Cooperative Learning, Science, and Student Learning.
PF	Cooperative Learning, Prior Knowledge, and Interdependence.
PG	Collaborative Groups, and Cooperative Learning.
PH	Students (as a resource), Cooperative Learning, Learning Groups, and Learning in Interdependence.

All these themes are candidates for me to examine an upper level of the themes. This process a preparation for me to develop my point of view or my theories. The formation of theoretical components may still request the contexts, which may be a paragraph context, an open coding context, or a thematic context. Such a perspective can aid cooperative learning researchers and science educators to deeper understand the relationship between the theories and the applications of cooperative learning to science education.

## From the Themes to “My Theories”

### The Definition of “My Theory”

My theory about Cooperative Learning and its relevant concepts can be developed to form a construct framework or model, which can be utilized to aid understanding of Cooperative Learning and relevant models. The applications of Cooperative Learning can be guidance, reflection, and connections to other content domains, such as science learning. The Development of “My Theory” allows my own opinion about Cooperative Learning to share with the audience, where I show a process to develop it based on the raw text data. I may not prove it, but the steps and logic can be seen.

### Cooperative Learning Embedded in Experience

Experience of the Interview Data was a framework for the interviewer and interviewees to have a dialogue about their own experience in Cooperative Learning and relevant educational events. Any opinions and theories are based on the analysis of Experience data. The opinions and models are social-context distributed, and culture-context distributed.

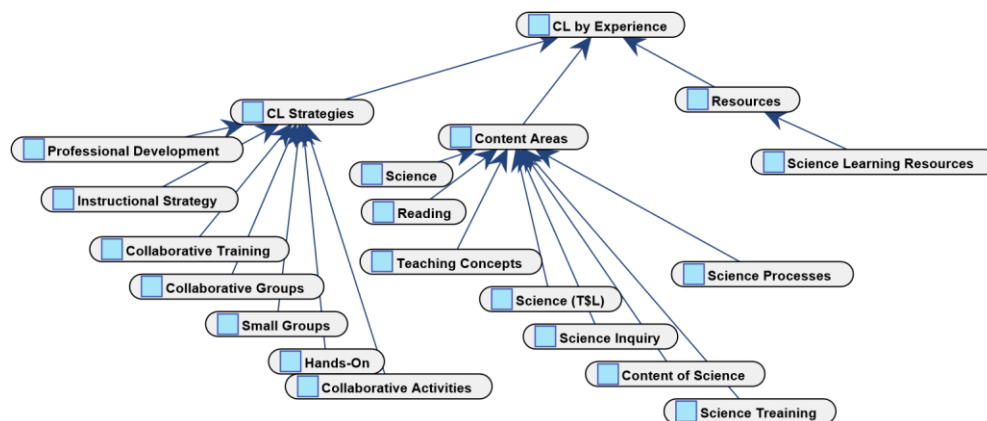
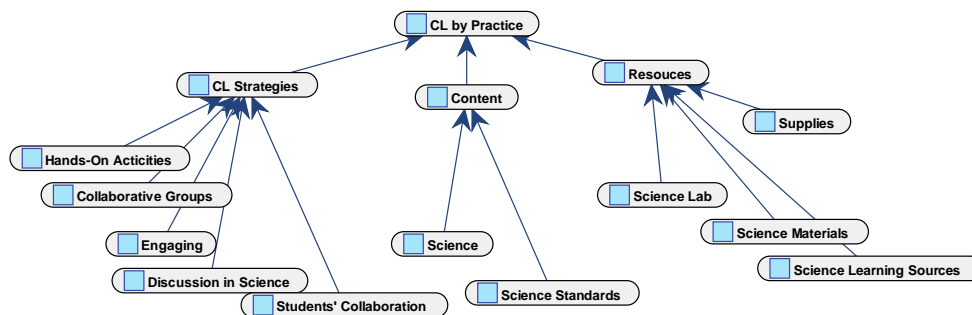


Figure 5.1: Cooperative Learning Model Embedded in Experience

My Theory about Cooperative Learning in Experiences is as shown in Thematic Graph 5.1, we can see that there are seven themes to support Cooperative Learning Strategies; there are eight themes to support Content Area; and there is only one theme to support Resources. My Theory about Cooperative Learning in Experiences, as a tiny model, was supported by Cooperative Learning Strategies, Content Areas, and Resources. We notice that there are imbalance weights of the themes to support the three categories.

### Cooperative Learning Embedded in Practice

Practice of the Interview Data was a framework for the interviewer and interviewees to have a dialogue about their own practice in Cooperative Learning and relevant educational events and concepts. Any opinions and theories are based on the analysis of Practice data. The opinions and models are social-context distributed, and culture-context distributed.



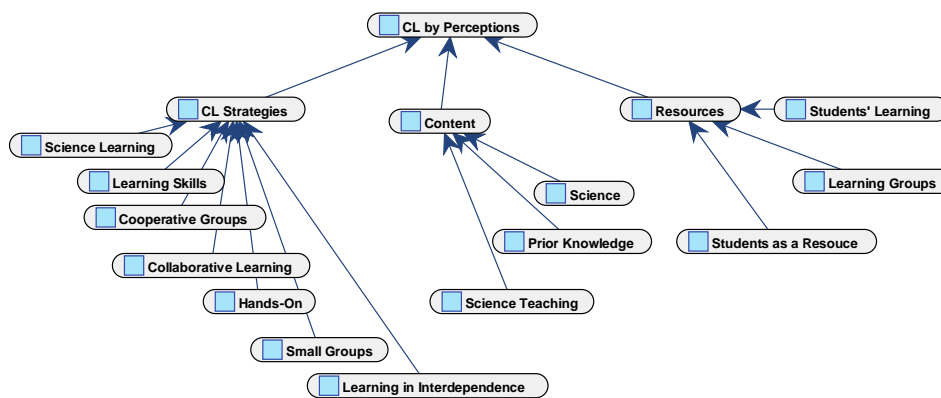
**Figure 5.2: Cooperative Learning Model Embedded in Practice**

My Theory about Cooperative Learning in Practice is as shown in Thematic Graph 5.2, we can see that There are five themes to support Cooperative Learning Strategies; there are two themes to support Content Area; and there are four themes to support Resources. My Theory about Cooperative Learning in Practice, as a tiny model, was supported by Cooperative Learning Strategies, Content Areas, and Resources. We notice that there are imbalance weights of the

themes to support the three categories. Specifically, the themes in Resources are obviously increased.

### Cooperative Learning Embedded in Perceptions

Perceptions of the Interview Data was a framework for the interviewer and interviewees to have a dialogue about their own practice in Cooperative Learning and relevant educational events and concepts. Any opinions and theories are based on the analysis of Perceptions data. The opinions and models are social-context distributed, and culture-context distributed.



**Figure 5.3: Cooperative Learning Model Embedded in Perceptions**

My Theory about Cooperative Learning in Perceptions is as shown in Thematic Graph 5.3, we can see that there are seven themes to support Cooperative Learning Strategies; there are three themes to support Content Area; and there are three themes to support Resources. My Theory about Cooperative Learning in Practice, as a tiny model, was supported by Cooperative Learning Strategies, Content Areas, and Resources. We notice that there are imbalance weights of the themes to support the three categories. Specifically, the themes in Resources are obviously decreased.

All analyses above are at the micro level, which provides the steps and logic for the audience to understand the processes from the raw data to the themes and further theories. I can

see that there are lots of details that can be further discussed. I can pave the way to more general conclusions. However, it is the time to wrap it up. We may see some leaps from the step-by-step analysis to the general discussion.

### **General Discussions**

Cooperative learning is widely used with these 5<sup>th</sup>-grade teachers in science class and science lab. As some teachers mentioned, it is structured, explained, student-owned, self-managed, and socially engaging. The teacher's role is to be the facilitator interacting with students during their academic tasks. The teacher's goal is to guide students and hold them accountable for their learning while cooperatively working with others. The main challenge during cooperative learning is working together to reach the objective. Another challenge is having the materials to implement the activity for students. Yet, teachers teach the students about taking turns, problem-solving, and working as a team. Somehow, teachers find a way to obtain materials for the students whether they buy the materials themselves or ask for donations. It is about overcoming the challenges to make it beneficial for the students to have hands-on activities while enhancing their communication and academic skills. One of the features of cooperative learning is obtaining the interdependence students need for accountability. It all happens face-to-face either individually or as a group while simultaneously working with others.

Some participants have received professional development in implementing cooperative learning, but the new or less experienced teachers have had some exposure or have been taught by their fellow colleagues. Staying current on teaching methods means also meeting the needs of the students to achieve learning success. Cooperative learning takes planning time. So, teachers need to plan together and collaborate on what and how an objective is going to be reached and taught purposely. The purpose of cooperative learning in the classroom is developing lifelong skills like

communication, problem-solving, critical thinking, team building, sharing, planning, collaboration, and goal setting.

Whether it takes place in the classroom or at the science lab, cooperative learning can be done effectively if students are facilitated throughout the lesson. Students' roles may be provided to guide them through their responsibility and make the team accountable for their learning while simultaneously obtaining the student objective. Engagement and interaction elevate the classroom climate to that of taking risks and problem-solving to improve education.

### **My Positionality of the Study**

Positionality is the disclosure of how an author's racial, gender, class, or other self-identifications, experiences, and privileges influence research methods. The statement of my positionality in the study can enhance the trustworthiness and credibility of the empirical data as well as its theoretical contribution. I am an elementary science teacher who taught in South Texas for more than 24 years. I believe cooperative learning can help teachers to rethink their pedagogical strategies. Further, the lack of science learning resources is a very serious problem in current science education. There are 99% of Latinos/Latinas students. Economically the students are at low SES. Their learning and education deserve to be considered by many different stakeholders. As a Latina science teacher and researcher, I want to clarify some facts and find some solutions to help elementary students in their science learning and education.

This is a qualitative case study. Its main purpose was to put educators' perceptions, experience, and practice into a study to uncover the challenges faced when implementing cooperative learning strategies. In this era, it is all about critical thinking, problem-solving, teamwork, communication, collaboration, technology, and active engagement. Looking back to Johnson and Johnson (1990), Slavin (2011), Piaget, Vygotsky, Dewey (Dat-Tran, 2014), and

Bandura (Dat-Tran, 2013), they all formed an actual blueprint for active learning in an engaging classroom environment among their peers. It encourages learners to see others' perspectives and compare them to their individual knowledge to further discover comprehensive opportunities for knowledge. When the theoretical background of these theorists is put into action, their blueprints come into the formation for an active and engaging cooperative learning environment. This setting is clearly a learner-centered learning environment that is structured around student roles and teacher facilitation. Plainly, it's about providing the learners the opportunity to take ownership of their individual learning to effectively be able to apply it to everyday situations.

As one of the structures of cooperative learning, small groups are utilized to maximize the learning variation of the learner. This step motivates educators' perceptions, experiences, and practices to come together to put this pedagogy into action.

### **Enlightenment and What I Have Learned in This Study**

I believe a descriptive case study with constructivist grounded theory were an appropriate combination for my study. I also knew that my research questions included both descriptive questions and analytical questions. In addition, I prefer both descriptive analysis and structural analysis. Thus, the two research methods are complementary.

### **The Findings across Participants and Aspects**

The structured thematic coding and analysis provided very strong findings in three aspects, Experience, Practice, and Perceptions. Table 5.1, 5.2 and 5.3, Figure 5.1, 5.2, and 5.3 graphically revealed common phrases. These are the fundamental elements for me to construct cooperative learning models in terms of different aspects, Experience, Practice, and Perceptions. In addition, I can describe any aspects of them with aid of these fundamental elements.

Cooperative Learning Strategies, Content, and Resources were supported by different critical elements.

### **Implications for Practitioners, Professional Development Facilitators, and Decision-Makers**

The findings in the case study were both descriptive and analytical. The descriptions tell the professional development facilitators and decision-makers stories. The professional development facilitators and decision-makers can better understand science teachers are facing the challenges with their own language, emotions, and perceptions.

The systematic analysis informs professional development facilitators and decision-makers what models and structures can be discovered to find the essence at an explorative level. For example, in Figure 5.2, the professional development facilitators and decision-makers can recognize the Resources in four elements: Science Lab, Science Materials, Supplies and Science Learning Resources. The analysis systematic provided this information and allowed me to determine if science education and learning require all of these resources.

### **What I have Learned from the Study**

To solve a science learning issue can use both descriptive and analytical methods. Science education needs learning theories such as cooperative theories. Some teachers' experiences in science learning surprised me that they knew some elements related to cooperative learning as well as some segments to systematic perspectives such as Hands-On, and small groups. Even if they do not how to systematically apply cooperative learning theories to their science teaching and learning practice, they have basic knowledge and problem-solving skills which are related to the cooperative learning and science education. Thus, the professional development facilitators

and decision-makers should continue to strengthen the professional development considering cooperative learning and science education.

### **Conclusion**

As a methodological design, the combination of a descriptive case study anchored through the constructive grounded theory enhanced the research quality and broadened horizons of both descriptive and analytical phases. From the beginning of the analysis, it was easy to start with descriptive analysis and then the advanced phase is an analytical phase. The data and research questions dominated and guided what kind of research methods and designs. There were four research questions, in which question one was more descriptive and the other three questions were more analytical.

A descriptive case study guided the findings that all participants realized that they require support in science education and further they mentioned they needed more support in Science Lab and supplies. Their teaching experiences in elementary schools, included in their statements and comments, vividly described the stories they lived and challenges they faced. The teachers' beliefs influence the perspectives for teaching and learning and pedagogical strategies. Understanding their perspectives can improve the professional development plan. Teachers' perspectives for the science teaching and learning influence their teaching performance and how they actively apply the learning theories, such as cooperative learning in the pedagogical practice. However, these descriptions are not sufficient to provide effective findings and suggest the actions being taken at an upper administrative level.

### **Recapping and Selecting Paragraphs of the Research Study Significance**

The research findings will provide information and feedback to the office/institutes of professional development on how to improve the professional development programs. This research will support the teacher's growth professionally while amplifying their professional knowledge. It will also help examine the teachers' own practice and measure their individual expectations of themselves in their work environment. Thus, teachers may utilize professional development to acquire new and up-to-date knowledge and resources. Professional development serves as a construct for their conceptual understanding of their individual work ethic. Professional development will provide new perspectives of other learning and/or academic examples, teaching reflection, and complement gains to their expertise.

The research findings can suggest the school district curriculum development office with the model/ opinions of the learning/ pedagogical strategies. Curriculum development can suggest a series of pedagogical strategies for teachers to use as additional instructional resources and practices to formulate assessments based on the state TEKS and/or district goals to monitor student growth. Research-based strategies in school curricula may emphasize modeling, guiding students, and using new material in a time frame. Thus, teacher learning can be supported with curricular development focused on teaching and learning strategies connected with certain curriculum subject matter. Effective instructional and learning strategies can be flexible enough to use across grade levels and subject areas (Ramos' significance of the Study. p.13)

The significance of the study required an analytical phase to find a structure-based essence, which aids the administrators of the school district to understand a more intensive relationship between science teaching, learning, education, and cooperative learning. Thematic analyses provided a visualized analysis based on the interview data and findings.

The stakeholders can understand that cooperative learning was supported by different conceptual groups: cooperative learning strategies, content, and resources. However, these components were supported by different sub-groups. Understanding that cooperative learning was model and framework distributed. As stated differently, different groups of teachers, different elementary learning environments, and different cultural learning societies represented cooperative learning, science education, science labs, and supplies in different ways. Relevant stakeholders and administrators should carefully understand the study findings and analyze the relationships among these thematic components. As such, the administrative leaders may find alternative ways to design the professional development plan and seek different solutions for the science lab and supplies. The descriptive phase informed us of vivid information while the analytical phase encouraged seeking deep core essence.

### **Future Research Studies**

Several points may be helpful for the researchers to think about the study in the future.

1. Increase the interview data, which allows researchers and stakeholders to see the saturation of the analysis.
2. A mixed methods approach may also be appropriate to receive the information from both qualitative and quantitative aspects.
3. Expanding the field to educational technology as an independent dimension to examine Cooperative Learning.

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## APPENDIX

## APPENDIX

### TERMS AND PHRASES IN EXPERIENCE, PRACTICE AND PERCEPTIONS

#### Participant A's Experience

Phrase	Count	N
5 <sup>th</sup>	2	2
5 <sup>th</sup> grade	2	3
professional development	2	2
th grade	2	2

#### Participant A's Practice

Phrase	Count	N
cooperative learning	4	2
45 min	3	2
fill out an exit	2	4
30 min	2	2
60 min	2	2
exit ticket	2	2

#### Participant A's Perceptions

Phrase	Count	N
cooperative learning	4	2
students need	2	2
teaches students	2	2
thought process	2	2

#### Participant B's Experience

Phrase	Count	N
cooperative groups	6	2

science lab	5	2
60 hours	4	2
th grade	4	2
5 th grade	3	3
using cooperative groups	3	3
3 rd	3	2
5 th	3	2
cast 2017	3	2
science standards	3	2
using cooperative	3	2
2016, cast 2017 science	2	4
3 rd and 4	2	4
60 hours of training	2	4
60 hours to review	2	4
attended cast 2016, cast	2	4
attending sessions for two	2	4
cast 2016, cast 2017	2	4
cast 2017 science training	2	4
curriculum and share instructional	2	4
district also provides training	2	4
hours to review science	2	4
lab teachers so 60	2	4
obtained about 60 hours	2	4
provides training for science	2	4
rd and 4 th	2	4
school district also provides	2	4
science curriculum and share	2	4
science training that provides	2	4
sessions for two days	2	4
teachers so 60 hours	2	4
training for science lab	2	4
training that provides attending	2	4
2016, cast 2017	2	3
2017 science training	2	3
also provides training	2	3
attended cast 2016,	2	3
cast 2016, cast	2	3
cast 2017 science	2	3
curriculum and share	2	3
district also provides	2	3
hours of training	2	3
hours to review	2	3
obtained about 60	2	3
past three years	2	3
provides attending sessions	2	3
rd and 4	2	3
review science curriculum	2	3
school district also	2	3
science lab teacher	2	3
science lab teachers	2	3
sessions for two	2	3
share instructional methods	2	3
teachers so 60	2	3
training for science	2	3

training that provides	2	3
2016, cast	2	2
2017 science	2	2
4 th	2	2
also provides	2	2
attended cast	2	2
attending sessions	2	2
cast 2016,	2	2
district also	2	2
grade teacher	2	2
instructional methods	2	2
lab teacher	2	2
lab teachers	2	2
past three	2	2
problem solve	2	2
professional development	2	2
provides attending	2	2
provides training	2	2
review science	2	2
school district	2	2
science curriculum	2	2
science training	2	2
share instructional	2	2
teach science	2	2
three years	2	2
two days	2	2

## Participant B's Practice

Phrase	Count	N
grade level	11	2
science lab	6	2
weekly with my grade	4	4
delivery of instruction	4	3
cooperative groups	4	2
feedback from my students	3	4
instructions as i observe	3	4
lab and i notice	3	4
level and i plan	3	4
made as i obtain	3	4
modifications to my instructions	3	4
need to be made	3	4
notice that adjustments need	3	4
observation of my delivery	3	4
observe my students work	3	4
plan daily for science	3	4
planning time for science	3	4
science lab is weekly	3	4
students through exit tickets	3	4
time for science lab	3	4
work through the daily	3	4
daily for science	3	3
lab is weekly	3	3

notice that adjustments	3	3
observe my students	3	3
students through exit	3	3
time for science	3	3
usually make modifications	3	3
adjustments need	3	2
classroom talk	3	2
daily lab	3	2
exit tickets	3	2
make modifications	3	2
obtain feedback	3	2
plan daily	3	2
planning time	3	2
provide feedback	3	2
science curriculum	3	2
students work	3	2
usually make	3	2
beginning of the year	2	4
able to purchase	2	3
looking for ideas	2	3
math and science	2	3
need to purchase	2	3
students are able	2	3
become better	2	2
classroom pet	2	2
complimentary supplies	2	2
grade class	2	2
make sure	2	2
may help	2	2
meet weekly	2	2
science content	2	2

## Participant B's Perceptions

Phrase	Count	N
cooperative groups	14	2
groups allows	8	2
also helps	6	2
using cooperative groups	5	3
academic language	5	2
groups helps	5	2
using cooperative	5	2
allows them to communicate	4	4
also learn to present	4	4
assigned roles are rotated	4	4
comfortable with their roles	4	4
constructive criticism from others	4	4
develop their networking skills	4	4
develops their presentational skills	4	4
discussion time versus independent	4	4

groups helps to strengthen	4	4
helps to strengthen students	4	4
helps with their oral	4	4
language as they discuss	4	4
oral presentation in front	4	4
others as a means	4	4
others thinking and ideas	4	4
plus the assigned roles	4	4
provides discussion time versus	4	4
role and not become	4	4
time versus independent seat	4	4
use of academic language	4	4
using cooperative groups allows	4	4
using their own strengths	4	4
versus independent seat work	4	4
well as accepting constructive	4	4
working in groups allows	4	4
working on their weaknesses	4	4
accept others thinking	4	3
accepting constructive criticism	4	3
become to comfortable	4	3
communicate and talk	4	3
cooperative groups allows	4	3
criticism from others	4	3
develop their networking	4	3
develops their presentational	4	3
discussion time versus	4	3
experience each role	4	3
findings which helps	4	3
front of others	4	3
helps to strengthen	4	3
ideas as well	4	3
independent seat work	4	3
learn to present	4	3
learning groups helps	4	3
means to improve	4	3
person will experience	4	3
plus the assigned	4	3
present their findings	4	3
presentation in front	4	3
provides discussion time	4	3
roles are rotated	4	3
strengthen students using	4	3
strengths while working	4	3
thinking and ideas	4	3
time versus independent	4	3
use of academic	4	3
versus independent seat	4	3
well as accepting	4	3
working in groups	4	3
accept others	4	2
accepting constructive	4	2

also learn	4	2
assigned roles	4	2
communications skills	4	2
constructive criticism	4	2
discussion time	4	2
independent seat	4	2
learning groups	4	2
networking skills	4	2
oral presentation	4	2
others thinking	4	2
presentational skills	4	2
provides discussion	4	2
seat work	4	2
strengthen students	4	2
students using	4	2
time versus	4	2
versus independent	4	2
beginning discussion of concepts	3	4
better understand the concept	3	4
classroom activities and discussion	3	4
concept before beginning discussion	3	4
connection to the classroom	3	4
cooperative groups is that cooperat	3	4
facilitator and clarifying misconceptions	3	4
groups allows the teacher	3	4
groups is that cooperative	3	4
hands on activity helps	3	4
helps them to better	3	4
helps them to make	3	4
helps them to use	3	4
ive learning groups helps	3	4
listen to their discussions	3	4
make the relevant connection	3	4
misconceptions that would probably	3	4
missed if the teacher	3	4
perception on cooperative groups	3	4
prior knowledge during hands	3	4
teacher did not walk	3	4
That cooperative learning groups	3	4
thinking as they work	3	4
use their prior knowledge	3	4
walk around and listen	3	4
activities and discussion	3	3
allows the teacher	3	3
around and listen	3	3
concept before beginning	3	3
discussion of concepts	3	3
discussions and question	3	3
facilitator and clarifying	3	3
groups is that cooperat	3	3
hands on activity	3	3
ive learning groups	3	3
knowledge during hands	3	3
make the relevant	3	3

perception on cooperative	3	3
probably be missed	3	3
question their thinking	3	3
That cooperative learning	3	3
understand the concept	3	3
use their prior	3	3
work on activity	3	3
activity helps	3	2
beginning discussion	3	2
better understand	3	2
clarifying misconceptions	3	2
classroom activities	3	2
ive learning	3	2
prior knowledge	3	2
relevant connection	3	2
That cooperative	3	2
walk around	3	2
accountable for their learning	2	4
activities to engage students	2	4
believe in using hands	2	4
experience but also helps	2	4
learning experience but also	2	4
students and have students	2	4
students explore this allows	2	4
using hands on activities	2	4
activities to engage	2	3
believe in using	2	3
center learning environment	2	3
experience but also	2	3
explore this allows	2	3
hands on activities	2	3
center learning	2	2
engage students	2	2
learning environment	2	2
learning experience	2	2
students explore	2	2
using hands	2	2

### Participant C's Experience

Phrase	Count	N
5 th grade	5	3
5 th	5	2
th grade	5	2
cooperative learning	3	2
small groups	3	2
excellence in science teaching	2	4
need to provide students	2	4
regional collaborative for excellence	2	4
science classes and hands	2	4
taught 5 th grade	2	4
working in small groups	2	4
year of science classes	2	4

classes and hands	2	3
collaboration with utrgv	2	3
collaborative for excellence	2	3
completed a year	2	3
excellence in science	2	3
hands on experiments	2	3
need to provide	2	3
taught 5 th	2	3
texas regional collaborative	2	3
utrgv i completed	2	3
working in small	2	3
year of science	2	3
attended several	2	2
professional development	2	2
provide students	2	2
regional collaborative	2	2
science classes	2	2
science teaching	2	2
scientific processes	2	2
taught 5	2	2
texas regional	2	2

### Participant C's Practice

Phrase	Count	N
grade level	4	2
current position	3	2
grade level for science	2	4
level for science	2	3
overcome this challenge	2	3
resources for science	2	3
students are given	2	3
cooperative learning	2	2
one way	2	2

### Participant C's Perceptions

cooperative learning	14	2
believe that students	3	3
common goal	3	2
students need	3	2
work together	3	2
build positive relationships among	2	4

positive relationships among students	2	4
build positive relationships	2	3
cooperative learning setting	2	3
positive relationships among	2	3
relationships among students	2	3
solve the questions	2	3
understand the concept	2	3
among students	2	2
become independent	2	2
best practice	2	2
build positive	2	2
independent learners	2	2
learning community	2	2
learning setting	2	2
positive relationships	2	2
relationships among	2	2
science class	2	2
student learn	2	2

### Participant D's Experience

Phrase	Count	N
cooperative groups	6	2
science lab	5	2
60 hours	4	2
using cooperative groups	3	3
science standards	3	2
using cooperative	3	2
curriculum and share instructional	2	4
district also provides training	2	4
hours to review science	2	4
lab teachers so 60	2	4
obtained about 60 hours	2	4
provides training for science	2	4
rd and 4 th	2	4
school district also provides	2	4
science curriculum and share	2	4
science training that provides	2	4
sessions for two days	2	4
teachers so 60 hours	2	4
training for science lab	2	4
training that provides attending	2	4
two days	2	2

### Participant D's Practice

Phrase	Count	N
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grade level	11	2
science lab	6	2
weekly with my grade	4	4
delivery of instruction	4	3
cooperative groups	4	2
feedback from my students	3	4
instructions as i observe	3	4
lab and i notice	3	4
level and i plan	3	4
made as i obtain	3	4
modifications to my instructions	3	4

### Participant D's Perceptions

Phrase	Count	N
cooperative groups	14	2
groups allows	8	2
also helps	6	2
using cooperative groups	5	3
academic language	5	2
groups helps	5	2
using cooperative	5	2
allows them to communicate	4	4
also learn to present	4	4
assigned roles are rotated	4	4
comfortable with their roles	4	4
develop their networking skills	4	4
develops their presentational skills	4	4

### Participant E's Experience

Phrase	Count	N
cooperative learning	4	2
5 th grade	2	3
cooperative learning activities	2	3
5 th	2	2
9 yrs	2	2
grade levels	2	2
learning activities	2	2
past 3	2	2
subject areas	2	2
th grade	2	2

### Participant E's Practice

Phrase	Count	N
cooperative learning	5	2

grade level	3	2
taking place	3	2
2 days a week	2	4
cooperative learning activities	2	3
days a week	2	3
learned to work	2	3
spend 2 days	2	3
2 days	2	2
learning activities	2	2
make sure	2	2
spend 2	2	2

### Participant E's Perceptions

Phrase	Count	N
cooperative learning	13	2
cooperative learning being utilized	3	4
perception about cooperative learning	3	4
learning being utilized	3	3
perception about cooperative	3	3
students learn	3	2
cooperative learning activities	2	3
helps students learn	2	3
also start	2	2
growth academically	2	2
helps students	2	2
learning activities	2	2
personal experiences	2	2
prior knowledge	2	2
teaching practices	2	2

### Participant F's Experience

Phrase	Count	N
cooperative learning	4	2
5 th grade	2	3
cooperative learning activities	2	3
5 th	2	2
9 yrs	2	2
grade levels	2	2
learning activities	2	2
past 3	2	2
subject areas	2	2
th grade	2	2

### Participant F's Practice

Phrase	Count	N
cooperative learning	5	2
grade level	3	2
cooperative learning activities	2	3
learned to work	2	3
learning activities	2	2

### Participant F's Perceptions

Phrase	Count	N
cooperative learning	13	2
cooperative learning being utilized	3	4
perception about cooperative learning	3	4
learning being utilized	3	3
perception about cooperative students learn	3	3
cooperative learning activities	2	3
helps students learn	2	3
also start	2	2
growth academically	2	2
helps students	2	2
learning activities	2	2
personal experiences	2	2
prior knowledge	2	2
teaching practices	2	2

### Participant G's Experience

Phrase	Count	N
5 th grade	4	3
5 th	4	2
th grade	4	2
10 years	2	2
4 categories	2	2
science training	2	2

### Participant G's Practice

Phrase	Count	N
45 minutes	5	2
science lab	4	2
beginning of the year	2	4
science lab teacher	2	3

working in groups	2	3
collaborative groups	2	2
lab teacher	2	2
model instructions	2	2
think pair	2	2

### Participant G's Perceptions

collaborative groups	4	2
able to build fundamental	2	4
must be in place	2	4
procedures and systems must	2	4
skills through collaborative groups	2	4
able to build	2	3
procedures and systems	2	3
skills through collaborative	2	3
students are able	2	3
build fundamental	2	2
collaborative learning	2	2
science lab	2	2
students enjoy	2	2
systems must	2	2
take place	2	2

### Participant H's Experience

Phrase	Count	N
cooperative learning	3	2
small groups	3	2
excellence in science teaching	2	4
science classes and hands	2	4
working in small groups	2	4
hands on experiments	2	3
professional development	2	2
provide students	2	2
regional collaborative	2	2
science classes	2	2
science teaching	2	2

### Participant H's Practice

Phrase	Count	N
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grade level	4	2
current position	3	2
grade level for science	2	4
level for science	2	3
overcome this challenge	2	3
resources for science	2	3
students are given	2	3
cooperative learning	2	2
one way	2	2
science class	2	2
students enjoy	2	2
working together	2	2

### Participant H's Perceptions

Phrase	Count	N
cooperative learning	14	2
believe that students	3	3
common goal	3	2
students need	3	2
work together	3	2
build positive relationships among	2	4
positive relationships among students	2	4
build positive relationships	2	3
cooperative learning setting	2	3
positive relationships among	2	3
relationships among students	2	3
solve the questions	2	3
understand the concept	2	3

## BIOGRAPHICAL SKETCH

Liza Ramos was born in McAllen, Texas and completed her entire education, including elementary education, secondary education, bachelor's degree, and master's degree in Texas. She received two master's degree in Master of Education in Educational Administration from The University of Texas Pan American in Edinburg in 2001, and in May of 2015, she received a master's in Master of Education in Curriculum and Instruction specializing in Reading. In May of 2023, she earned her Doctoral degree in Curriculum and Instruction specializing in science from the University of Texas-Rio Grande Valley. She can be reached at [ramosliza0@gmail.com](mailto:ramosliza0@gmail.com)