

THE EFFECTS OF THE FAN-N-PICK COOPERATIVE LEARNING STRATEGY ON
YOUNG SAUDI STUDENTS

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CERTIFICATION OF THESIS/PROJECT CAPSTONE WORK

We, the undersigned, certify that this project entitled THE EFFECTS OF THE FAN-N-PICK COOPERATIVE LEARNING STRATEGY ON YOUNG SAUDI STUDENTS By Sameha Sunaideh Al Matrafi, Candidate for the Degree of Master of Science in Education, Curriculum and Instruction in Inclusive Education, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

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Abstract

Cooperative learning allows students to share ideas, ask questions and give feedback. The “Fan-N-Pick” strategy is a cooperative learning strategy developed by Spencer Kagan. The purpose of this study was to examine the effectiveness of using the Fan-N-Pick cooperative learning strategy with young Saudi girls, aged 6-7, in science class to improve performance and participation. The research was conducted over a period of two weeks in an elementary school in Makkah, Saudi Arabia. The participants in this study were 48 female students from two science classes in the first grade. One class was the experimental group, and the other was the control group. The experimental group was taught by using the Fan-N-Pick cooperative learning strategy while the control group was taught by using a traditional, lecture method. The researcher compared the posttest scores and students' participation rates, as measured by observations during four lessons, between the control group and the experimental group. The results of this study showed significant improvement of students' performance and participation through using the cooperative learning Fan-N-Pick strategy.

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Introduction

Education is one of the most important ways to advance in all areas. Many advanced countries such as Korea, Malaysia, Singapore, Ireland and others became advanced because of their investment in education. Some people have devoted their efforts to develop strategies and ways to create a learning environment that stimulates thinking and creativity and improves the academic performance of students. One developer of the cooperative learning approach is Dr. Spencer Kagan (2003) who developed in collaboration with his team more than 250 structures aimed to improve learning through cooperation among students. Kagan (1999) affirms that cooperative learning positively affects students in the class. One of the Dr. Kagan's structures is Fan-N-Pick, which is the focus of my research. Fan-N-Pick is a cooperative learning strategy that helps students engage in the learning process and makes learning effective. This strategy helps students to build teamwork, develop thinking skills, share ideas and increase communication. Fan-n-Pick can be used to introduce a new subject, help student's analysis and evaluation, and review a topic (Kagan, 1994).

Research Question

The purpose of this research study is to understand the effectiveness and impact of using the Fan-N-Pick strategy and its variations in education and learning. The research question is, "What is the effectiveness of using a cooperative learning strategy with young Saudi girls, age 6-7 in science class to improve performance and participation?" The basis for this inquiry is to examine if the use of cooperative learning increases the performance and participation.

Significance to the Field

Cooperative learning plays an important role in education. Many studies have proven the effectiveness of using this method with the students. Cooperative learning has been applied in many educational institutions around the world. In Saudi Arabia cooperative learning is still new

to the schools. In 2014, Al Andalus School Jeddah was the first school in Saudi Arabia that adopted the Kagan cooperative learning method and style of teaching in all classes. Thus, this study is significant for several reasons. First, the Fan-N-Pick cooperative learning strategy has yet to be studied in Saudi Arabia. In addition, this study will help in concluding whether cooperative learning can improve science performance and participation in Saudi schools as it does in the US schools. In Saudi Arabia, there is a massive project called "King Abdullah bin Abdulaziz Public Education Development Project". It aims to develop education in all respects such as schools, curricula, teaching methods, and teacher development. Notably, this project is looking for the reasons of the low level of student performance in math and science and searching for teaching strategies that can help to raise the performance. Therefore, this study will provide insight into the effect of a cooperative learning strategy in science on young Saudi students.

Personal Significance

As a student, I like cooperative learning more than other methods. It makes me engaged in the class and helps support my social skills. Thus, I developed an interest in researching about cooperative learning because it would help me gain a better understanding of the effectiveness of using cooperative learning with students. Also, it could be an effective strategy to use in my future classroom.

Over the decades, the educational process has developed and transformed to suit the needs of young children and the skills needed by graduates to meet the job market demands. As such, each stage of education and schooling, from kindergarten, to elementary school, to high school, to college and to university equips the students with a specific set of skills and knowledge that allows them to succeed in their professional career post-graduation.

The primary research question this study is intended to answer is, “What is the effectiveness of using a cooperative learning strategy with young Saudi girls, age 6-7 in science class to improve performance and participation?” To this end, I reviewed literature on cooperative learning and the specific learning needs of first grade students in preparation for this study.

Literature Review

To achieve the ultimate objectives of learning and education, various methods, tools and strategies have been developed. Many of these strategies focus on certain skills such as verbal communication, teamwork, logic, writing, scientific reasoning, and analytic skills. Studies have researched the effectiveness of using cooperative learning strategies on students in general. Therefore, these studies provide evidence regarding cooperative learning and its impact on the students. The following is a literature review of the research.

Background of the Study

Saudi Arabia is a large country in the Middle East. The population of it is approximately 31 million. Saudi Arabia has sent over 150,000 students to different countries in the world to provide the work market with qualified Saudi citizens, and to build educational knowledge through academic research (Ministry of Education, 2015). The process of developing education in Saudi Arabia has progressed since 1932. Education has moved from learning in mosques, to learning in schools and universities. Students are separated by gender in all levels of their education (Gate of the Ministry of Education, 2015).

Saudi Arabia has been working to develop education through research-based instructional strategies and curriculum. However, the traditional learning style is still considered to be the most common in Saudi schools. Some teachers believe that traditional learning is good for

students to understand the content clearly, while other teachers believe in the importance of using modern approaches for both students and teachers. Educational policy-makers have decided to focus their efforts on helping prepare teachers to better educate students who are entering the twenty-first century work force. Therefore, development plans have focused for several decades on public education in order to prepare the Saudi people and schools to deal with the new technology and the rapid development in all fields. For this reason, the Ministry of Education in the Kingdom of Saudi Arabia has decided to reform schools, and teacher training. It has been implementing new teaching methods to improve the academic achievement of students, and the development of their intellectual and critical thinking skills (Ministry of Education, 2015).

Saudi Arabia has been making efforts to improve education, since the establishment of the Ministry of Education in 1953. Some of these achievements are: the availability of free education for all students, the spread of education in all parts of the country, the high increases of students in enrolled in primary school to 99%, and the achievement of gender equality. (Gate of the Ministry of Higher Education, 2015).

The development of education for female in Saudi Arabia. Saudi Arabia pays much attention to girls' education. Females' education in Saudi Arabia has been delayed for several reasons, including the Government's preoccupation with the unification of the country and the stability of governance and security. Also, prevailing customs and traditions were a major obstacle to girls' education. In 1940, the government opened schools for girls and told the parents the importance of sending their girls to schools. However, many Saudi families rejected the girls' education, reasoning that taking care of the house was best for them. After two years, due to the lack of girls coming to the schools the government closed them. In addition, the difficult

economic conditions and declining state budget led to a lack of resources. Therefore, Saudi Arabia put a huge effort to change the idea in Saudi families and encourage girls to learn in the early 1960's.

In 1960, the first king of Saudi Arabia, King Abdul Al-Aziz established the General Presidency for Girls' Education, which made every effort to achieve the education of women. Within ten years, it had opened many schools and universities for girls (Hakeem, 2012). Nowadays, Saudi women have become more active in the community. In addition, girls' education has become more advanced to meet the social and economic needs of the country. Girls' schools are in every part of the country with many colleges and universities built for them.

Schools in Saudi Arabia. Schools in Saudi Arabia are divided into three levels, which are: elementary, middle, and secondary. The elementary school is the most important level for students as they enter the learning process and establishment phase. The child needs to be six-years-old to enter elementary school. Elementary school includes six levels, which start at the first grade and finish at sixth grade. Then, the middle school has three levels, which begin with the level called first-grade of middle and end with the third-grade. Finally, the high school has three levels, which starts with the level called the first grade of high school and finishes at the third secondary grade. The school day starts at 7:00 A.M. and ends at 1:00 P.M. Although the Saudi schools still depend on traditional learning system, cooperative learning has begun to expand in the Saudi schools.

Research on Cooperative Learning in Saudi Arabia

Cooperative learning is still a new instructional method in Saudi Arabia. It was not promoted as an instructional technique used in the Saudi schools until five years ago, and it is still confined to the elementary schools. Therefore, we do not find a lot of research on the impact

of cooperative learning in Saudi Arabia. According to a number of universities in Saudi Arabia, a lot of research has not been published. This makes getting people's research difficult. Merebah (1987) is a Saudi researcher who examined cooperative learning in Saudi Arabia. He claims that no one before him has conducted studies about the cooperative learning in Saudi Arabia.

Therefore, there is a need to build knowledge through further research on cooperative learning in Saudi Arabia. Many people who have done research before have found that cooperative learning is an effective instructional approach with students. Consequently, teachers can help students improve their skills by using cooperative learning.

Theoretical framework

The theoretical framework for this study is based on social theory. According to Slavin (1995) cooperative learning results in a number of gains in learning. This is because cooperative learning raises social cognition among students.

Vygotsky's social learning theory principle is that the child's development depends on the interaction with other children and adults (Doolittle, 1995). The social interaction, which involves cooperation, supports cognitive development (Vygotsky, 1978). Vygotsky claims that a child may take a long time to absorb material or solve problem; however, it can be resolved and absorbed easily after interaction with parents or teachers or peers. Consequently, the child's competencies and skills can develop, which can be applied in the future. Vygotsky believes that student interaction with their peers is an effective way to develop social skills. He suggests that teachers use cooperative learning where the child can develop his skills with help from peers. Doolittle (1995) provides a comparison between the concepts of cooperative education and the theoretical constructs of Vygotsky's theory:

“Cooperative Learning Concept	Vygotskian Sociogenetic Construct
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Positive Interdependence	Developmental Interdependence
Face-To-Face Interaction	Social Mediation and Enculturation
Individual Accountability	Individual Development
Small Group Social Skills	Culturally Based Signs and Tools
Group Self-Evaluation	Monitoring Growth and Development”

(Doolittle, 1995, p.13)

All in all, cooperative learning allows students to work with each other, exchange ideas, and develop social skills that will serve them well in their lives (Eisner, 2003). Teachers can use this theory to help their students to develop their social and academic skills.

Cooperative Learning

Cooperative learning is defined as, "the instructional use of small groups so that students work together to maximize their own and each other's learning." (Johnson, Johnson, and Smith, 1991, p.5). Johnson and Johnson (1991) illustrated the three patterns of interaction between students as they learn. These patterns are: individualistically, competitively, and cooperatively. Students can work individualistically based on their own ability, without paying attention to the other students. They can work competitively to see who is the best and accept victory or defeat. Lastly, they can participate in assisting each other in collective learning. There are many studies that compared the effect of these three types. For example, Johnson and Johnson, and Tauer (1979) compared the effects of the three patterns, individualization, competition, and cooperation on students' achievement. The researchers found that the students in the cooperative learning environment had higher achievement than students working competitively and individually. Interestingly, in the cooperative case, the teachers perceived the students as their friends more than in the competitive or individualistic classrooms. Moreover, the students viewed each other

more positively than in the competitive and individualistic classrooms. As well, cooperative learning experiences encouraged interaction between minority students and majority students more than individualistic learning (Johnson & Johnson, 1981). Studies also noted that cooperative learning had a positive effect on self-esteem (Dimas, 1994), behavior (Galton, Hargreaves & Pell, 2009), attitude (Bayat, 2004), performance (Al-Qahtani, 2000; Cavalier, Klein & Cavalier, 1995), social skills (Hooker, 2011), motivation (Law, 2011) and achievement (Russo, 2014; Mevarech, 1985). Stevens and Slavin, (1995) investigated the effects of cooperative learning strategies on both general education students and special education students. The study was conducted over two years where the purpose was to determine the long-term effects of the Cooperative Integrated Reading and Composition (CIRC) program on academically handicapped students in regular classes, and non-handicapped students in terms of achievement, attitudes, and metacognitive awareness. The participants were 635 students in three elementary schools using the CIRC program compared to 664 students in four matched schools using the traditional instruction in Maryland. The results showed that CIRC students had significantly higher achievement in vocabulary, comprehension, and language expression. Furthermore, The CIRC students showed better metacognitive awareness than did their peers. There were no significant impacts on the students' attitudes towards reading or writing.

Generally, cooperative learning has been successful in most aspects of learning and education, such as participation, achievement, social skills, and self-confidence. Kagan (1999) expressed that cooperative learning failure is not due to the strategy itself. Rather, failure is often due to the way cooperative learning is implemented. He described six important keys to success of cooperative learning. These six keys are:

How to form teams (Teams), how to create the will among students to work together (Will), how to manage the cooperative classroom (Manage), how to foster social skills (Social Skills), how to make sure there is Positive Interdependence, Individual Accountability, Equal Participation, and Simultaneous Interaction (PIES), and how to structure the social interaction within groups to maximize different types of positive outcomes (Structures). (Kagan, 1999, p. 2)

Cooperative learning and traditional learning. In traditional learning, the teacher gives the information, assistance, criticism and feedback (Salomon & Perkins, 1998). In cooperative learning, the class is structured around small groups working together. In this method, the success of each group member depends on the success of the group (Lord, 2001). Cooperative learning and traditional learning differ according to Johnson, Johnson and Holubec (1984) in positive interaction, individual responsibility, personal characteristics of the members of the group, group leadership, support and encouragement, student goals, social skills, and the way in which groups operate. Cooperative learning is based on mutually positive interaction between the members where objectives are formulated in a manner requiring the students' dependence on the performance of all group members rather than on individual performance alone. Students vary in personal characteristics and abilities. The students in cooperative learning share their abilities and personal characteristics while the students in traditional learning do not. In cooperative learning, the student is responsible for teaching others in the group. It is expected for students to get support and encouragement from each other. However, in traditional learning groups, it is rare that a student bears the responsibility to teach another student in the group. The student's goal is to develop good working relationships with other students in cooperative learning classes, but in traditional learning groups the focus is generally only on completing the

task. In cooperative learning groups the students need some social skills to work collaboratively while in traditional learning groups, social skills are usually assumed but ignored. Also, the teacher using cooperative learning groups formulates procedures, decides what is the way best to manage the work, observes the members, analyzes the problems they face and gives feedback to each group. These fundamental differences between cooperative learning groups and traditional learning groups show us the shortcomings of the traditional learning approach, which is frequently used in the classroom.

Many researchers have conducted a comparison between the cooperative learning and traditional method among students in different areas such as performance, communication, and motivation. Messier (2005) examined two teaching methods, the cooperative learning and traditional lecture-based in China. After four Chinese middle schools used both styles, the researcher found that the achievement scores were higher in the traditional lecture-based groups as compared with the cooperative learning groups. On the other hand, Dotson (2001) also compared the two teaching methods in the US and found that the cooperative learning groups obtained higher achievement than a traditional lecture/independent style. Furthermore, cooperative learning significantly outperformed the conventional teaching in a study in Bangladesh. Aziz and Anowar (2010) examined the effects of cooperative learning and traditional learning on high school students on mathematics achievement. The results of this study showed a significant increase in mathematics achievement in the cooperative learning groups as compared to the traditional teaching groups. Also, there was cooperation between the group members in problem-solving and communication in the cooperative learning groups. Similarly, Bahar-ÖzvariŞ, Çetin, Turan and Peters (2006) compared the cooperative learning and individual, lecture-based learning in Turkey. The researchers found that the students in the

cooperative learning had higher achievement scores than those in the lecture-based learning. As well, the results of the observation showed the cooperative learning environment increased students' motivation towards their learning.

The results of the majority of the studies referenced above argue for the effectiveness of cooperative learning. Cooperative learning clearly shows a positive effect on students, as it leads to the development of positive attitudes towards subjects, classmates and teachers; develops students' personal character; and improves students' achievement. Within the field of cooperative learning, several specific structures have been designed to facilitate student learning.

Kagan structures. "Structures are simple, step-by-step instructional strategies. Most Kagan Structures are designed to increase student engagement and cooperation." (Kagan, 2008, p.1). Since 1968, Kagan has been developing cooperative learning structures. Now there are more than 250 structures. The structures have been designed for various functions, such as developing social skills, thinking, or motivation (Kagan, 2003). Some examples of Kagan cooperative learning structures are: Rally Robin, Timed-Pair-Share, Find-the-Fiction, and Three-step Interview. Kagan (2000) said the structures have been designed on the basis of four principles: positive interdependence, individual accountability, equal participation, and simultaneous interaction. The positive interdependence in cooperative learning is evident because individual success is based on the success of the others. Thus, the individual sees his/herself on the same side with others. This is in contrast to the competitive model, which produced negative results because the one student's win depends on the other's loss. Individual accountability is ensuring that each group member is individually responsible for a specific part of the group project. Equal participation is that all students participate in the classroom. Simultaneous interaction refers to all the students interacting in groups at the same time.

Kagan structures have been used for several years in the schools and showed positive results for both the teachers and students. Schools principals wrote about their experience with using Kagan structures in their schools. There was a great deal of support and interaction between students and teachers. Also, there was a significant increase in students' test scores and academic performance (Kennedy, 2000; Heusman & Moenich, 2003; Maddox, 2005). Cline (2007) showed that three Kagan structures: Rally Coach, Round Table, and Timed-Pair-Share had a positive effect on mathematics achievement of fifth-grade students. These three Kagan structures not only improved the students' performance, but also allowed students to share ideas, ask questions, support each other, and discuss possibilities. Dotson (2001) compared two groups of sixth-grade social studies students. One group used Kagan structures of cooperative learning, and the other group used the traditional lecture method. The Kagan instructional samples that were used are: Think-Pair-Share, Rally-table, Numbered Heads Together, Showdown, Teammates Consult, and 4S Brainstorming. The results indicated that the cooperative learning group showed higher levels of performance and social interaction than the other group. Also, it was found that Kagan Structures could be easily used in the classroom with no extra effort or time on the part of the teachers.

In sum, as the results of many research studies and the development of associated theories on Kagan Structures, the positive effect of the structures is shown not only through the level of performance, but also on students' personal development, multiple intelligence, and higher-level thinking (Kagan, 2000). For the purpose of this study, the Kagan Fan-N-Pick structure will be used.

Fan-N-Pick. Fan-N-Pick is a cooperative learning strategy designed by Spencer Kagan. The strategy steps are that the teacher designs cards with questions about the lesson. There is no

specific number of cards; the teacher could provide as many cards as needed. Students are divided into groups of four. The first student in the group makes a fan-shape of the cards provided by the teacher and asks another student to pick a card. The second student chooses the card, reads the questions and asks the third student to answer the question on the card. The third student answers the question. The fourth student checks whether the answer is right or wrong and praises the respondent or corrects the answer. Roles rotate after each turn (Evans, 2012). The principal Maureen Mulderig (2003) at Walberta Park Elementary School has used Kagan structures for years. She asked her students about the structures. Here are some student's answers about Fan-N-Pick: "I like Fan-N-Pick the best because it is really fun. We can do it with scrambled up words! That's why I like Fan-N-Pick.' — Brittany, 2nd grade"(Mulderig, 2003, p.1). "I like Fan-N-Pick because it makes me a better speller' — Matt, 2nd grade"(Mulderig, 2003, p.1). "I like Fan-N-Pick because I like getting ideas for stories.' — Jason, 2nd grade" (Mulderig, 2003, p.1). Speer (2010) used different cooperative learning strategies in the class every week with seventh-grade students. One of the strategies used was Fan-N-Pick. The students enjoyed working together in the cooperative learning groups. The teacher asked the students which method they preferred; most answers were the Numbered Heads Together and Fan-N-Pick strategies.

Certainly, research supports the Kagan structures including the Fan-N-Pick strategy. Slavin (1996) agrees that when cooperative learning is compared to individual learning there is no doubt that cooperative learning has the greatest effects on the group members. However, some researchers question whether cooperative learning can be used in science classrooms. In the following section, the researcher provides an explanation of cooperative learning in science.

Cooperative Learning in Science

Cooperative learning plays a role in the development of scientific thinking skills and communication processes. Cooperative learning creates a social environment, which in turn stimulates the interaction between students and their teachers and their peers (Kagan 1994; Wood, 1992; Slavin, 1990). Herreid (1998) mentioned that some science teachers do not want to waste time in re-processing and other methods of teaching, while others science teachers are convinced that there is a need for new ways of learning in science classrooms. Many studies have examined the impact of cooperative learning on understanding science and academic achievement in science. The results of these studies have shown that cooperative learning has a positive impact on the science classroom (Johnson & Johnson, 1990; Slavin, 1978; Slavin 1990). Interestingly, in the Middle East, Ebrahim, (2012) examined the effect of cooperative learning in five science classrooms in Kuwait. The number of participants was 163 girls from elementary schools. In a comparison between the pre-test and post-test and the questionnaire given to the students, results showed that cooperative learning has a positive impact on student achievement in science and the use of social skills compared to traditional education.

In brief, cooperative learning allows students to share ideas with each other, helps the students discover new things, and allows all students to ask and answer questions. It also helps in the development of thinking and the students' understanding of scientific content skills through strengthening and broadening their knowledge of the subject. It can be seen from the studies that cooperative learning had a better impact on the students than the traditional method. Also, Kagan structures of cooperative learning are useful strategies that can be used in the classroom to build teamwork, develop communication, and improve students' skills. The next section presents the curriculum in Saudi Arabia including science curriculum.

Curriculum in Saudi Arabia

Saudi Arabia attaches great importance to education, which is the largest budget item in Saudi Arabia. These resources address curriculum development. The curriculum is an ongoing process of development (Technical and Vocational Training Corporation, 2015). A comprehensive project for the development of the curriculum is a national project that aims to develop all the elements of the curriculum according to the latest theories of educational, scientific, and contemporary approaches. The Ministry of Education, in conjunction with educational consulting firms and academic institutions, has a strategic plan to improve the curriculum for all stages. The rapidity of growth and development in Saudi Arabia over the past ten years has led to changes in the curriculum to conform to the needs of students and to create links between education and practical life (Hakeem, 2012). Science and mathematics are curricula areas that are developed constantly. The next section explores the primary stage science curriculum.

Science curriculum. In 2007 there was a big change to the curriculum for all levels of education. Science books for the first grade become more focused on giving students the knowledge and skills in science and developing their thinking skills and strategies to allow them to resolve problems in everyday life. Also, it focused on the development of the practical skills such as reading images, scientific writing, and drawing models.

Some teachers' and parents' viewpoints are that the science curriculum for the first grade contains a lot of information that exceeds the students' understanding. Consequently, the teacher needs to make plans and use strategies to facilitate understanding.

The Ministry of Education wrote two books for first grade science. One is for the first semester and the other for the second semester. The science book in the first semester of first

grade has many photos and fun exercises. It is colorful and attractive for the students at this age. The book has three units. The first unit is about plants. It focuses on two topics: the living creatures and how the plants grow and change. The second unit is about animals. It is about animal species, their locations and food. The third unit is about the earth. It talks about the earth's resources and how to maintain them. After each unit, there is a test. The tests are developed by the Ministry of Education. Finally, after representing the science curriculum for the first grade, the next section will introduce the first grade students' characteristics.

First Grade Student's Characteristics

The first grade is the first year when the students enter the elementary school for the first time. Usually, children at this term are excited to go to the school and learn. Of course, children's characteristics in the first grade differ from child to child, but there are common characteristics among them. Wilson (2011) introduced in her book some of the common characteristics of children in first grade. For instance, they are excited about learning, active, capable of competition and cooperation, social workers, and they thrive on and are responsive to encouragement.

Hamre and Pianta (2015) examined ways in which children are at risk of school failure in a study of 910 children, between the ages of 5-6 years in the first grade. Children were selected based on their status on demographic characteristics and functional (behavioral, attention, academic, social problems) indicators of risk reported by their kindergarten teachers. The researcher found that the students who had strong instructional and emotional support had better performance than other children. Additionally, students in less supportive classrooms had an uncomfortable relationship with teachers and more struggle with them. Accordingly, at this age, emotional support for young students can affect their achievement and their relationships. It can

be seen that kids have great emotional levels and the educators should take this into account in this age.

Meanwhile, the first graders can be annoying and active at the same time. They like to work but get bored quickly. Therefore, the teachers should focus on the channeling of their energy by creating fun exercises, giving them concrete objects to work with, and playing outside (Wilson, 2011).

Cognitive and physical level for students of the first grade. Children in the first several years of school are moved from the pre-stage to the operational level (Jarsild, 1968). Furthermore, they are facing speedy conceptual and language development as they learn to read and write. Plus, the information does not seep into their minds easily. In terms of their cognitive development, the cognitive skills are important to help children to understand various sides of a subject. They are still evolving the ability to think abstractly. Accordingly, concrete ideas and objects are most valued and understood. As well, most of them are engaged in the process and very interested in learning and doing tasks. Besides, they like to ask questions to expand their interpretation of the world around them and discover new things (Wilson, 2011).

In terms of physical development, in this age, students probably have new teeth beginning to appear, so they can get sick easily. Although the students are different in their physical development, often they have large amounts of energy. They move frequently and find it difficult to focus on a specific thing for a long time. They love to play outside or in the gym. Also, in many cases, researchers found that the girls are higher in language and fine motor skills than boys at this level (Santrock, Woloshyn, Gallagher, Di Petta., & Marini, 2004; Wilson, 2011).

This literature review examined the background of the study, the development of education for females in Saudi Arabia and research on cooperative learning in Saudi Arabia. Furthermore, cooperative learning in general and the effectiveness of it with an emphasis on Kagan structures and the Fan-N-Pick strategy was explored. Also, it covered the science curriculum in Saudi Arabia and the common characteristics of first grade students. The literature shows that many studies have investigated the effects of cooperative learning, including Kagan cooperative learning structures. They found that cooperative learning is a very effective instructional strategy. By comparison, the researchers found that the cooperative learning had a positive effect over the traditional/ lecture method. Next, I present the methodology for this research study in the following section.

Methodology

The purpose of this study was to answer the following question: What is the effectiveness of using the Fan-N-Pick cooperative learning strategy with young Saudi girls, aged 6-7, in a science class to improve performance and participation? This strategy is one of Kagan's simple structures for cooperative learning. This strategy improves students' social and thinking skills. Also, it allows students to build teamwork and share ideas with other students.

While there has been much research done on the effectiveness of cooperative learning on students, there is a lack of research on this topic in Saudi Arabia. Teachers often rely on the traditional, teacher-focused learning style in Saudi classes. Therefore, the author wished to investigate the effectiveness of cooperative learning, especially the Fan-N-Pick strategy with elementary school aged Saudi students. Specifically, the study investigated the effects of cooperative learning on the students' performance and participation in science class.

Setting

The Kingdom of Saudi Arabia is located in Western Asia and is the second largest Arab country. Arabic is the first and official language in the country, and English is its second language. According to the 2014 census, the population of Saudi Arabia is about 30,770,000. Saudi Arabia is famous for its export of oil, and this is what contributes to the stability of its economy. The researcher investigated the effects of the Fan-N-Pick strategy in an elementary school in the city of Makkah, which is in western region of Saudi Arabia. It has a great position of cultural and spiritual significance for Muslims because it has the largest Islamic mosque in the world. Approximately 75% of the inhabitants in Makkah are Saudis, and the remaining 25% is non-Saudi nationals from Arab countries.

According to the most recent data, Makkah has 1,350 schools. The study took place at a public elementary female school in the eastern part of the city. Moreover, the school is in a middle class district of the city. This elementary school serves 300 students from first grade through sixth grade, with an average class size of 24 students. All students and teachers are female. The first grade has two classes and both of these classes were involved in this study.

Participants

The participants in this study were 48 first grade students. The first grade is the first year when the students are required to attend the elementary school for the first time; kindergarten programs for younger children are optional. The entire participant population were all female, and between the ages of six and seven. All of the students were native Arabic speakers. In most Saudi schools, the students remain in one classroom throughout the day, and the teachers come to them and teach their lessons. Therefore, the classrooms involved in this study were two classrooms: first-grade classroom A and first-grade classroom B. Each class had 24 students and was taught science by one teacher, who alternated teaching between the classrooms and grades

throughout the school day. The science class for the participating classrooms met twice a week for 45 minutes.

Most of the students who participated in the study are from the neighborhood where the school is located and are citizens of Saudi Arabia. A few of the students are from various Arab nationalities and they speak Arabic as well. The consent forms had to be sent to the parents and the teacher to ask the students if they wanted to participate in this study. One class was designated as the control group and the other class as the experimental group.

The science teacher is in her thirties with 11 years of experience. She has taken several workshops, which were created to improve the performance of teachers and were organized by the Saudi Ministry of Education on such topics as active learning, effective use of technology, and strategies in the lower grades of elementary school.

Design

The research was designed to find out the effect of one of Kagan's cooperative learning structure, specifically, the Fan-N-Pick strategy, on student performance and participation. The researcher used a quantitative approach as the data were participation tallies and assessment scores, which could be analyzed statistically. The research was originally intended to take place over two weeks, starting in August, 2015 and ending in September, 2015. However, due to the Hajj and holiday break, which started from September 9 and ended on October 4, the research was conducted on the first week of September and the week after the students were back from the break in October. Despite these scheduling issues, the researcher was able to observe the study in two lessons in both classes.

To implement the Fan-N-Pick strategy, the researcher, with the assistance with of the science teacher, prepared four colorful cards. Each card included a picture on it, which was

related to the topics. The students were asked to answer the question (See appendix A). The students were divided into six groups of four and each group was given the four cards. Student 1 in the group held the cards in a fan and the next student in the group picked a card. Student 2 showed the card and asked the question aloud to the group. Then, student 3 answered the question. Also, student 4 assessed whether the answer was right or wrong, and praised or corrected as needed. Finally, the roles switched by rotating to the next one to pick a new card.

On the first day, students in the experimental group were divided into six groups. The groups were selected randomly. The teacher taught the students the first lesson from their textbook, which was about the living creatures. Then, the teacher explained the Fan-N-Pick strategy for participants. After that, the researcher employed the strategy for four days. In the class designated as the control group, the teacher taught the students without using the strategy. She used the traditional/lecture method that she usually employs.

The participating teacher and the researcher took notes and monitored students' participation with each other and wrote comments. After that, they filled out the participation table (See Appendix E). The lessons in these science classrooms were divided between two units. Each unit had two topics. The first unit was about the plant and the topics were the living creatures and how the plants grow and change. The other unit was about animals, which covered two topics: the animal species and their locations and food. The students in both classes were given posttests after each unit. Due to the posttests being written in Arabic, the researcher translated the tests to English for the purposes of this paper. (See appendices B & C).

Data Collection

The data collected for this study was from the posttests and participation table. Upon approval from the school and the students who participated in this study, I began this study. First,

through observation, both teacher and researcher took notes to determine the students' levels of participation and recorded these notes in the participation table. Second, the posttests, which were created by the Saudi Ministry of Education for the general science curriculum used throughout Saudi Arabia, were administered after each unit. Finally, all of the data was placed in a safe place. Additionally, to preserve the students' identities, the students were identified through a coding system, rather than by name (ex. "Student 1" and "Student 2").

Data Analysis

After collecting the data, the researcher compared the posttests scores between both the experimental and control groups. Next, the researcher compared the students' participation, as measured by the observations of the four lessons, between the experimental group and the control group. Next, the researcher organized the data collected into a chart in order to provide the data in a clearer format. The researcher also presented this data in a graph in order to compare the control and experimental groups of my research. Accordingly, the results of this study showed significant improvement of students' performance and participation through using the cooperative learning "Fan-N-Pick" strategy. This examination was used to answer the primary research question, "What is the effectiveness of using a cooperative learning strategy with young Saudi girls, age 6-7 in science class to improve performance and participation?"

Findings

The purpose of this study was to investigate the effect of cooperative learning, principally The Kagan structure, Fan-N-Pick on the performance and participation of Saudi students in science class. The researcher analyzed the data between two first grade classrooms: one class was the experimental group, and the other was the control group. The experimental group was

taught by using the Fan-N-Pick strategy, while the control group was taught by using the traditional lecture method. The results of this study were collected through the table of participation and posttests over four lessons in the science classes. In the following section the researcher presents the results of the data collection and analysis for the research question: "What is the effectiveness of using the Fan-N-Pick cooperative learning strategy with young Saudi girls, age 6-7 in a science class to improve performance and participation?"

Observation

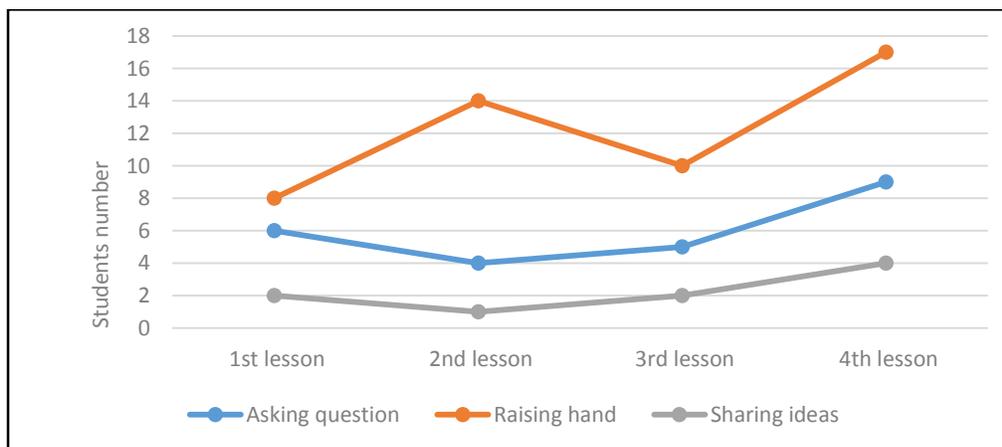
The data for this study was collected through two methods: classroom observation, and posttest assessment. The researcher assessed student participation by measuring the number of students who raised their hands, shared ideas, and asked questions in class. Every time a new student demonstrated a new behavior, it was noted on a checklist. The results of these observational sessions can be seen in Figure 1 and 2.

As can be seen between the two observational data tables, there was a marked difference in participation between the experimental and control groups. Additionally, during the observation of the experimental group, both the teacher and researcher noted increases in some students' positive behaviors, such as self-confidence. Additionally, the researcher met with the teacher after each lesson to discuss students' participation.

Control Group. Figure 1 shows the target behaviors (asking questions, raising hand, sharing ideas) among students in the control group across the four lessons of the study. During the first lesson, the incidences of sharing ideas among students was higher than other behaviors, which was eight students. Of these eight, six students participated by asking questions, but only two students participated by sharing ideas. In the second lesson, the number of students who raised hands was higher, which was 14 students. However, only one student shared her idea with

the teacher during the lesson. On the third lesson, the number of students raising their hands was 10, while only four students asked questions during the lesson. The incidences of sharing ideas was still lowest among students. Lastly, during the fourth lesson, the students' participation as evidenced by sharing ideas and raising questions increased. A significant increase on the incidences of raising hand among students was also evident. The number hit 17 students. A comparison of the three target behaviors in the control group during the course of the study showed that students raising their hands was the greatest number as compared with other behaviors.

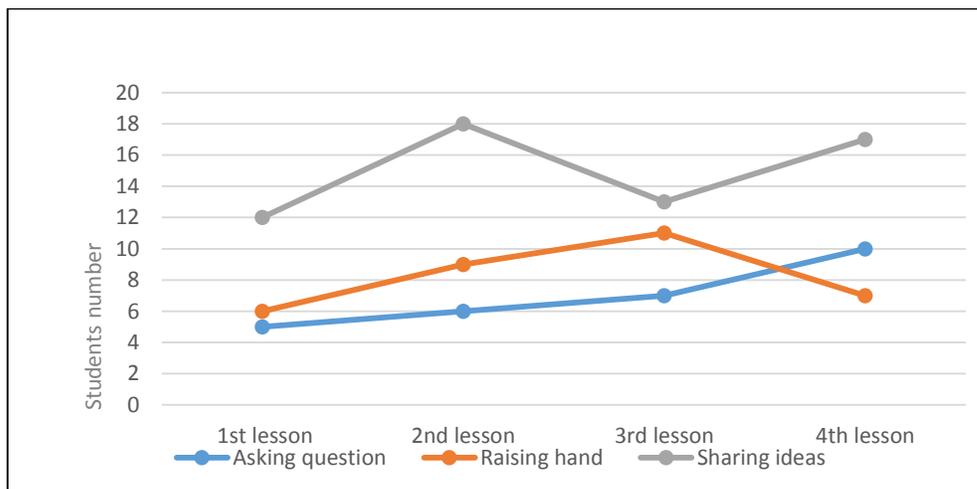
Figure 1. Student participation in the control group during the four lessons.



Experimental Group. Overall, the first lesson had the lowest number of students demonstrating participation behaviors during the course of the study. Five out of 24 students participated by asking questions while six students participated by raising their hands. In contrast to the control group, the largest number of students noted as participating was sharing their ideas with the teacher or classmates in their groups. During the second lesson, the number of students' participation rose with the highest number of student participation being 18 by sharing ideas. The number of students who asked questions during the lesson was six students, while by raising

hand was nine students. During the third lesson, the incidences of raising hand and sharing ideas converged. In most of the lesson, the students relied on participation by sharing ideas, the number was 13 students and 11 students by raising their hands. Furthermore, only eight students participated by asking questions. One the fourth lesson, there were 17 students who shared their ideas, which was the highest number during the lesson. Whereas, seven students participated by raising hands and ten by asking questions. In general, the table indicates that the highest number of students' participation was by sharing ideas as compared with the other two behaviors.

Figure 2. Student participation in the experimental group during the four lessons.

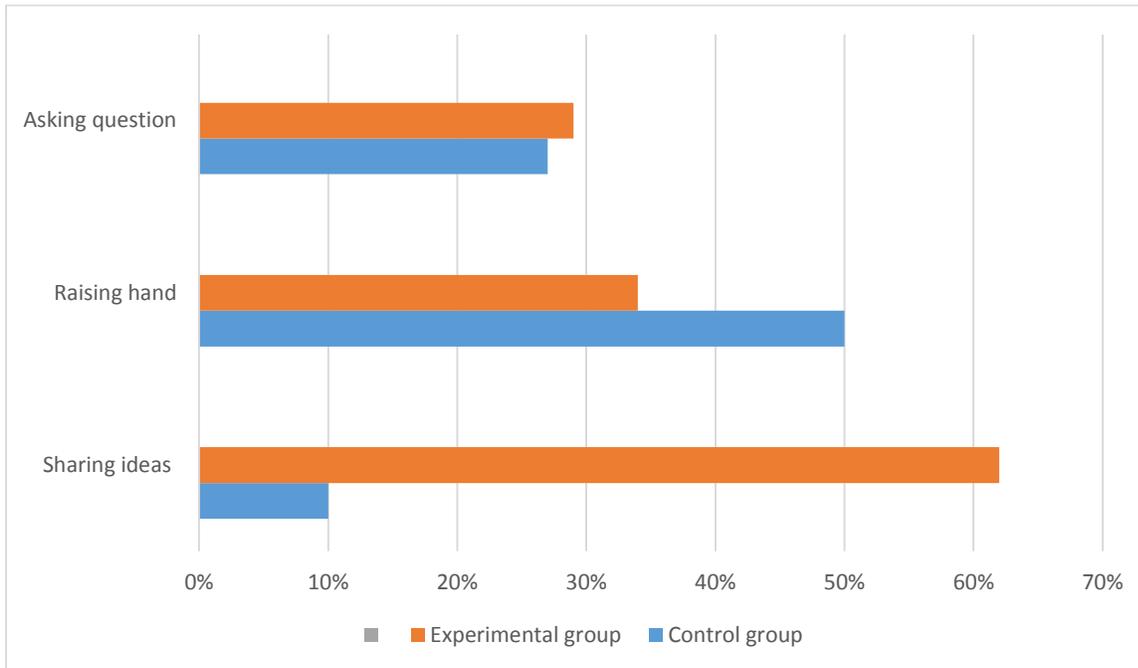


Comparison of students' participations for the experimental and control groups.

Figure 3 shows the difference between the participation of the experimental and control groups. Moreover, as Figure 3 indicates the rate of students who participated by sharing ideas in the experimental group was much higher than the control group. Interestingly, the rate of raising hands in the control group was higher than in the experimental group. The average of students raising hand was 50% in the control group and 34.38% in the experimental group. However,

there was no significant difference between the number of students asking questions in the experimental and control groups.

Figure 3. Comparison between students' participation in the experimental and control groups.



Generally, there were differences in students' participations in each behavior during the four lessons. This difference might be due to the way that the teaching styles influences one behavior more than other behaviors. As we can see in the traditional learning, students relied on raising hand to participate more than other behaviors, while in the cooperative learning, students relied more on the sharing ideas. Overall, the first lesson had the lowest number of students demonstrating participation behaviors during the course of the study in both groups.

Posttests

The researcher assessed students' performance by giving them posttest assessments, which were part of the standardized learning curriculum created by the Saudi Ministry of Education for use in elementary schools. Both the experimental group and the control group were scheduled to take these tests regardless of whether they participated in the study. There

were two post-tests for both the experimental and control groups, and these were delivered at the end of each weekly unit. The first test consisted of four questions and the second test consisted of six questions. Both tests included a task involving putting pictures into categories. A total of 24 students took these tests from each group. Table 1 indicates the tests scores for each student in the experimental and control groups. Additionally, Figure 4 compares scores between posttest 1 and 2 in the control and experimental groups, on the next page.

Table 1

The Tests Scores for Each Student in the Experimental and Control Groups.

Student number	Test 1 score 4 points in the control group	Test 1 score 4 points in the experimental group	Test 2 score 6 points in the control group	Test 2 score 6 points in the experimental group
1	2	3	5	6
2	4	4	5	6
3	4	4	6	6
4	3	4	4	6
5	3	4	3	6
6	2	4	4	6
7	4	4	6	6
8	4	4	6	5
9	2	4	5	6
10	4	4	2	6
11	4	3	3	5
12	4	4	6	6
13	4	3	6	4
14	4	4	5	5
15	2	4	4	6
16	3	4	2	6
17	4	4	6	6
18	1	4	5	5
10	4	2	3	6
20	4	4	6	6
21	3	4	6	4
22	2	4	4	6
23	4	3	3	5
24	1	4	5	6
Average	3.04	3.75	4.58	5.63

Posttest 1. This test was conducted in both the experimental and control groups. The first assessment consisted of the students labeling six pictures of plant parts by placing physical pictures into the correct category: flower, seed, and bud (See Appendix B). The first test was given to students after the second lesson, at the end of week 1. The average of the experimental group was 4.58, which was higher than the mean score of the control group. The difference in the posttest was 17% higher in the experimental group. Furthermore, only 13 students in the control group attained a score of 100% with their posttest, while 20 students in the experimental group were able to receive a score of 100%.

Posttest 2. The second test was given at the end of the second, and final, week of the study and was given after the fourth lesson to the experimental and control groups. It had the same general format of the Posttest 1 assessment, where students were asked to place six pictures into categories (See Appendix C). The average of the experimental group on posttest 2 was higher than the control group's by 25%, with more than half of the students in the experimental group earning a score of 100% with their posttest, while only eight students in the control group received this score.

Summary of the Findings

In this study, the cooperative learning Fan-N-Pick strategy was shown to be an effective learning tool for first-grade Saudi students. It increased student participation and performance in science class, as measured by observational rubrics and posttest assessments. The observation and posttests were used in order to check for a significant difference between students who studied with the cooperative learning and those who did not. The incidences of sharing ideas among students was much higher in the experimental group, while the average for raising hands was higher in the control group. However, there was no significance difference observed

between the number of students asking questions in the experimental and control groups. In addition, the student scores on the two posttests were higher in the experimental group than in the control group. The posttests scores were used to measure the cooperative learning effectiveness in increasing student performance in science class. The findings of this study showed that the cooperative learning strategy had a clear positive impact on participation and ability to successfully complete assessments for these students.

Discussion

The analysis of overall results of the study indicated that the use of Fan-N-Pick strategy improved students' performance and participation in science class. The comparison between the traditional learning and cooperative learning was important to find out which method of education best meets the needs of students. This section presents the relationship of these findings to the literature reviewed, an analysis of participation, implications for practice and for future research, and limitations.

Relationship to the Current Literature

The results of this study support what was discussed in the literature review regarding the effectiveness of cooperative learning on increasing student participation and performance. Student participation overall was higher in the experimental group, which used the Fan-N-Pick strategy, compared to the students in the control group that used the traditional/ lecture method. Through this study, the results support Johnson, Johnson & Holubec (1984) who wrote about the difference between the traditional and cooperative learning. Both teacher and researcher noticed a rise in social skills among the students who used the cooperative learning. Self-confidence was higher among students every time they used the cooperative learning strategy. Furthermore, the role of the teacher in cooperative learning differs from traditional learning. The teacher was

helping students, giving them reactions about their work, and observing the students. These results are consistent with the Vygotsky's social learning theory and the previous research, which showed that cooperative learning increased social skills among students. Additionally, the current study supported the previous research which found that cooperative learning had a positive impact on the students more than traditional learning (Dotson, 2001; Aziz and Anowar, 2010; , Bahar-ÖzvariŞ, Çetin, Turan and Peters, 2006).

Analysis of Participation

Three behaviors were targeted in this study, which were: asking questions, raising hands, and sharing ideas amongst the students in the experimental and control groups. There was a marked difference in participation in each behavior. The results indicated that students in the experimental group had a higher percentage in sharing ideas as compared to the control group. While the number of students raising their hands was higher in the control group. Perhaps this difference in rates was due to the adoption of each teaching style on a behavior more than other behaviors. In cooperative learning, students divided into groups, which made sharing their ideas with the classmates easier in the group. Moreover, the cooperative learning strategy encouraged students to discuss the questions and answers between themselves. While in traditional learning, the structure of the class did not encourage students to participate through sharing their ideas. It might be that students perceived the only way to participate was by raising their hands. Therefore, the rate of raising hands was higher in the control group.

During the observation of participation, increases in self-confidence among students in the experimental group were noted. For example, the students were talking loudly, were initiating answers, and were leading their groups. The Fan-N-Pick strategy allowed students to question and assess other students in the group, which enhanced the students' self-confidence

and responsibility towards the group. From these results, it can be concluded that the cooperative learning improved first-grade students' participation in the science class.

Implications for Practice

Teaching is rapidly developing worldwide. Constantly, there are many new educational strategies and methods developed to meet the needs of students. In addition, research has revealed new teaching methods that are more effective in teaching. One of the effective teaching approaches is cooperative learning. This present study demonstrated the effectiveness of cooperative learning in increased student performance and participation as compared to traditional learning. Therefore, teachers should be flexible enough to adapt approaches that reflect the best results. The traditional teaching approach is the most common method used in Saudi schools. Because of this, The Ministry of Education should plan for the Saudi teachers to experiment with new teaching methods such as cooperative learning. Additionally, teachers should include several cooperative learning strategies in their classroom management plan.

Through this study, the researcher noted that the teacher was afraid to use cooperative learning strategies. The teacher looked at these strategies as a waste of time. Also, she thought that traditional learning focused on the content better. After applying the Fan-N-Pick strategy, the teacher said that she had not expected that the strategy was easy to apply and created an educational environment promoting motivation and thinking. Furthermore, the teacher found that the students loved the strategy. Therefore, teachers should experiment with cooperative learning strategies before negatively judging them.

The cooperative learning environment allows students to think, create, and participate. This environment fits with the characteristics of students in the elementary classes. Consequently, teachers need to change their classroom environment by using cooperative

learning strategies that are commensurate with their students, which lead to improve the performance in the class and make students more capable of thinking, creativity, and communication.

Implications for Future Research

Since the strategy was able to find a positive effect of the Fan-N-Pick strategy, I suggest that researchers continue to collect data about this strategy and its impact on students.

Additionally, I would recommend that research be conducted to show whether this strategy will have a positive impact on the different grades of elementary students. Further studies could collect data to know the challenges that may be faced by the teacher in the cooperative learning environment.

Moreover, the researcher recommends in conducting research to find out what the impact of cooperative learning in long term in the classroom. This could be determined by increasing the duration of the study. Furthermore, this research was conducted to find the effect of cooperative learning on achievement and participation. As previously mentioned, this research found that cooperative learning can raise social skills among students. Therefore, further studies could focus on the effect of cooperative learning on social skills.

Since this study focused on one of the Kagan Structures of cooperative learning, which was the Fan-N-Pick strategy, further research studies could focus on other Kagan strategies. Additionally, other studies should focus on the effectiveness of cooperative learning strategies on the achievement, participation, and social skills of students in various grades. Future studies can also take place in different classes to determine its effectiveness with various subjects. This might help to more fully determine the impact of the Kagan structures of cooperative learning.

Finally, this study was conducted with female students. I recommend further studies be conducted with males or both males and females. Also, further studies could take a place at other locations and areas in Saudi Arabia to find the implications of cooperative learning on students.

Limitations

Although the researcher made every effort to make this study as valid as possible, the study is limited by some restriction that may affect its generalizability. The first limitation was the limited sample of participants, 48 students, who were involved from two classrooms. A larger number of participants would get deeper and more comprehensive results. In addition, the duration of the study was relatively short, only two weeks. If the study had gone on for a longer period of time perhaps more data could have been collected and the impact of the strategy would have been clearer. Furthermore, there was a break for about one month between the weeks when the study was conducted. The break was a little bit long, so that could have affected the students' ability to effectively use the strategy.

Cooperative learning has become a common style in education within the last years. This learning style is comprehensible due to the extent of positive research, which supports it among educators. This research is one of the few research studies conducted to see the effect of a specific Kagan structure on the cooperative learning of Saudi students. This study could be useful to teachers in encouraging the use of cooperative learning rather than traditional learning. I conducted this comparison to illustrate to teachers, especially Saudis teachers, that there are other teaching approaches that can be used in the classroom. In traditional learning, some students engage in the class but not all. Additionally, the traditional learning can make for a competitive class. Therefore, it is not creating a friendly environment in the class. Plus, students

can easily slip between the cracks because they are not participating in the class. All of that can be avoided in the cooperative learning environment.

Teachers should use cooperative learning in the classroom as an effective approach to teach. Furthermore, teachers should try to use many of the cooperative learning strategies that are commensurate with the students and their needs. The Fan-N-Pick strategy was shown to be effective in increasing students' performance and participation through this study.

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Appendices

Appendix A

Lesson Plan

1. Objective:

Unit one:

- The students will understand what distinguishes the living creatures.
- The students will be able to know how the plants are grown.
- The students will be able to name the parts of the plant.

Unit two:

- The students will be able to know different kinds of animals.
- The students will be able to know some species of animals and where they live and eat.
- The students will be able to understand the difference between the types of animals

2. Materials

1. A science text from the textbook of the first grade.
2. Several copies of the cards that will be using for the cooperative learning strategy.

3. Environment:

Student's desks are designed in a group of four in the cooperative learning class.

4. Design

1. Students will use the Fan-N-Pick strategy in order to improve their performance and participation.
- 2- The strategy steps will be that the teacher will design cards with questions about the lesson. Students will be divided into groups of four. The first student in the group will make a fan-shape of the cards provided by the teacher and will ask the other students to pick a card. The second student will choose the card, read the question and will ask the third student to answer the question on the card. The third student will answer the question. The fourth student will check

whether the answer is right or wrong and will praise the respondent or correct the answer. Roles will rotate after each turn.

3- The cards will be designed follows:

Unit one: There will be four colorful cards. Each card has a different picture of a part of the plant. The question for all these four cards will be “What is the part of the plant in the picture?”

Unit two: There will be four colorful cards. Each card has a different picture of animal. The question for all these four cards will be “What is the type of the animal in the picture?”

5. Instructional

- Teacher will apply the strategy after the explanation of the lesson is done.
- Teacher will monitor the students’ participation while they are in the group.
- Teacher will give the students the post-test after each topic.

Appendix B

Post-test of 1st unite/ plant topic by Arabic language and translation of it

أَصِلْ بَيْنَ الصُّورَةِ وَالْكَلِمَةِ الْمُنَاسِبَةِ فِيمَا يَلِي:

ثَمَرَةٌ



.1

زَهْرَةٌ



.2

بَادِرَةٌ



.3

بُذُورٌ



.4

Posttest 1 translated to English

Match between the picture and the word appropriate as follows:

Fruit



Flower



Bud



Seeds



Appendix C

Posttest of the 2nd unite/animals topic by Arabic language and translated to English

أَصِلْ بَيْنَ الصُّورَةِ وَالْكَلِمَةِ الْمُنَاسِبَةِ.

	.٢	بَرْمَانِيٌّ		.١
	.٤	طَائِرٌ		.٣
	.٦	سَمَكَةٌ		.٥
		حَسْرَةٌ		
		تُدِيٌّ		
		زَاحِفٌ		

٦٢ مُرَاجَعَةُ الْفَصْلِ الثَّلَاثِ

Posttest 2 translated to English

Match between the picture and the word appropriate as follows:



Amphibian



Bird



Fish



Insect



Mammal



Reptil

Appendix E

Table for teacher observation of students' participation

Participation	Asking question	Raising hand	Sharing ideas
Student 1			
Student 2			
Student 3			
Student 4			
Student 5			
Student 6			
Student 7			
Student 8			
Student 9			
Student 10			
Student 11			
Student 12			
Student 13			
Student 14			
Student 15			
Student 16			
Student 17			
Student 18			
Student 19			
Student 20			
Student 21			
Student 22			
Student 23			
Student 24			