

**EFFECTS OF COOPERATIVE LEARNING ON ACADEMIC PERFORMANCE OF
COLLEGE STUDENTS IN SAUDI ARABIA**

by

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled EFFECTS OF COOPERATIVE LEARNING ON ACADEMIC PERFORMANCE OF COLLEGE STUDENTS IN SAUDI ARABIA by NORAH MASHUOJ ALSHAMMARI, 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

The purpose of this study was to investigate the effects of cooperative learning on academic performance of college students in Saudi Arabia. This experimental quantitative study sought to answer the research question: How would jigsaw cooperative learning strategy affect college students' academic performance in Saudi Arabia compared to the traditional teacher-centered approach? The study involved 40 females ranging in age from 20 to 25, in an education course in Hail City. Over a period of four weeks, the researcher conducted the study in two classes: one class was the control group, and the other was the experimental group. The experimental group was taught by using a jigsaw strategy while the control group was taught by using a traditional teacher-centered lecture. The results showed students who were taught by the jigsaw strategy had a better understanding of the content as compared to the students who were taught by lecture. Therefore, the conclusion of this study is that the cooperative learning had a positive impact on students' academic performances in Saudi Arabia.

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Effects of Cooperative Learning on Academic Performance of College Students in Saudi

Introduction

Education is the passage of knowledge from persons with knowhow to the persons with a desire to get enlightened (Robyn, 2014). This could be accomplished through cooperative learning. According to research, college students perform better through cooperative learning than from teacher-centered approach (Robyn). This is due to the ability to integrate interpersonal relationship to social interdependence theory (You, 2014). Cooperative learning also enables students to effectively accomplish practical procedures, perform valid research hence making it easier for the educators to manage student's learning. In addition, CL encourages the students to effectively contribute towards the problems solving leading to better understanding of the subjects (Davidson & Major, 2014). Hence, cooperative learning could be presumed to be a better approach that could benefit students in Saudi Arabia, only if it could be implemented properly. Traditional learning is teacher-centered method that focuses on memorization and rote learning. In Saudi Arabia, traditional learning is the commonly adopted strategy in college education. However, according to research cooperative learning may benefit students more than the traditional approach (Mohammad, 2004). According to research, students' participative and active involvement in subjects increase their level of understanding (You, 2014). Through making learning fun, enjoyable and autonomous, cooperative learning could be effective in enhancing the understanding of students (You, 2014).

Statement of the Problem

The decision to research on cooperative learning in Saudi Arabia is based on reality that most of the colleges in Saudi Arabia to date embrace traditional learning strategy. According to Aronson (2014), student's performances excel when cooperative learning strategies, including jigsaw, are implemented. It affirms that teacher-centered classroom does not effectively equip the

students with enough resources to broaden their level of understanding. Moreover, cooperative learning has been proven to equip the students with ability to derive deeper understanding of subjects (Molly, Dingel, & Aminul 2014). Compared to traditional learning methods, cooperative learning improves interaction in groups, promotes individual responsibility for learning, and metacognitive awareness (Dallmer, 2007). The benefits of cooperative learning also include increased cooperation and more well-developed social skills, motivation, and retention of knowledge (Davidson & Major, 2014). The research on the advantages of cooperative learning suggests that it is a worthy topic of study in Saudi Arabia.

Cooperative learning has begun to show potential benefits in the Saudi Arabian education system in many aspects. For example, it increases student's understanding of content, academic achievements, and participation in class (Al-Enazi, 2007). Hence, cooperative learning condition enables students to be challenged by their colleagues; this triggers the desire and agility to spend extra time to digest learning contents that are not well understood. In fact, the students get to learn from their colleagues through consultations in cooperative learning environment (Dallmer, 2007). The current study investigated the effects of cooperative learning by using jigsaw strategy on the academic performance of college students in Saudi Arabia. The independent variable was the jigsaw strategy while the dependent variable was academic performance of students.

Purpose of the Study

The purpose of the study was to explore the effects of cooperative learning, namely the jigsaw strategy, on the academic performance of college students in Saudi Arabia. Also, it explored whether there was a significant improvement in performance of college students as a result of the use of a cooperative learning approach since the jigsaw strategy was a new strategy in Saudi Arabia. Furthermore, the study gave the teachers in Saudi Arabia an opportunity to learn more about cooperative learning and what the jigsaw strategy was.

Research Question/Hypothesis

This quantitative study sought to answer the research question: How would jigsaw cooperative learning strategy affect college students' academic performance in Saudi Arabia compared to the traditional teacher-centered approach? The hypothesis of this study was that cooperative learning would improve college students' academic performance in Saudi Arabia.

Theoretical Framework

In every aspect of life, effective learning requires teamwork and cooperation to enhance productivity of individuals. Learning institutions also operate the same way (Dallmer, 2007). For example, adopting cooperative learning would enable the students to learn from each other; this enables them to immensely gain interpersonal skills through group participation (Davidson & Major, 2014). Furthermore, cooperative learning enables the students to have broader understanding of the subjects since they are able to collaborate in the learning process. This affirms that students who adopt jigsaw strategy are able to perform better academically compared with their counterparts who are taught through teacher-centered strategy (Robyn, 2014). In cooperative learning, group discussions enhance higher understanding comparatively to traditional or conventional teaching that heavily depends on teachers as resources. This implies that academic excellence is based on team work (You, 2014). Hence cooperative learning could be classified among ways of embracing teamwork in academics. Many college students would be willing to learn, share skills and competencies with their colleagues, and also develop leadership and other important aspects of teamwork (Davidson & Major, 2014).

According to research, students learn better when they are challenged and can be motivated by their classmates. For example, Dallmer (2007) noted that when a student arrived at a clear conclusion to a problem which had caused frustration in the class, his classmates would perceive the solution and the problem as being less difficult, because it was solved by a fellow

student (Dallmer, 2007). Students often believe that teachers are experts in the subjects that they teach, so in a traditional, teacher-centered classroom, students may be intimidated by the subject matter, thinking that it is only easy or solvable by the teacher or another expert. A potential result of this perception is that when students try to work on the material by themselves, they can become very frustrated or lack motivation to complete the task (Chih-Hsiang et al., 2013). In a cooperative learning environment the students are involved in deriving solutions to the questions through collaboration; whereby the students get to integrate different methods and processes of solving the same “question” especially from their colleagues and teachers. When students solve the same problems especially through group work, there would be differences among the students who work independently when handling assignment problems. The differences in level of understanding among students who learn through jigsaw, and their counterparts who learned via the teacher-centered approach, can be compared when the two teams are evaluated afterwards (Robyn, 2014).

Cooperative learning enables the students to identify their areas of specialty, which enables the weak students to know whom to approach when they have misconceptions or difficulties in subject areas. Instructors in Saudi Arabia often do not have time for consultation with students due to tight lesson schedules that have to be attended to on a daily basis (Davidson & Major, 2014). Furthermore, some students do not interact freely with instructors, be it in class or afterwards. Therefore, cooperative learning motivates students' critical thinking and helps them clarify ideas through debate and discussion with their peers.

Definition of Key Terms

Cooperative learning. This is a learning process that involves restructuring classes within small groups so that teamwork is embraced. In addition, it is a learning strategy that

encourages group participation in handling assignments and academic or learning problems (Dallmer, 2007).

Group performance. This is the involvement of individuals in performing single tasks in a group in order to achieve a common goal (Davidson & Major, 2014).

Jigsaw strategy or technique. A typical jigsaw activity involves students becoming experts, then teaching their group about what they have learned. For example, in a class using the Jigsaw strategy the teacher has a general topic of that the class is to learn more about in their cooperative learning groups. The topic is divided into separate sections, and each individual is given a different sub-topic to research by using class notes, text books, etc. Each student becomes an “expert” on the subtopic. These experts then get together into groups of students with the same topics, to discuss what they have learned about the subtopic. These meetings serve several useful functions, including: checking their understanding of the material, review, revise, clarify concepts, etc. After this step, the students meet together in their original groups, and each of the individual students, now “experts”, are responsible for teaching their teammates about their topic of study. The teacher then provides support by listening to the following discussions, noting difficulties or providing more in-depth knowledge (Koppes, 2002).

Teamwork. This is an interactional approach that students or group of persons work in groups to achieve distinct targets (Molly et. al., 2013).

Traditional teacher-centered approach. This is a learning process whereby students work independently in their quest to achieve their academic obligations. Instructors deal with students independently in enhancing their academic success (British Psychological Society).

Personal efforts. This is the ability to practice individual abilities in achieving a distinct goal (Chih-Hsiang et. al., 2013).

Significance of the Study

The current study on cooperative learning was the first of its kind conducted on college students in the Northern Saudi Arabia, where the conventional or traditional teaching is commonly used in colleges. What research that has been done has focused on students in elementary, middle, and high schools, but not on adults studying in universities. Adult students, due to their fully developed cognitive ability, personal and professional goals, and social maturity are a different group of learners than children or adolescents; however, less research has been done on adult education in general than on children (Knowles, Holton, Swanson, 2012). Therefore, in order to best meet their needs, this group deserves special attention, as what may be shown to be effective for younger people may not be as effective for adults (Knowles, Holton, Swanson, 2012). However, according to Kagan and Kagan (2009), cooperative learning strategies have been shown to have promise for all groups of students, including older learners. Thus, the deficiency in the literature in is something that this study hopes to address, especially in regards to creating a better understanding of cooperative learning and its effects on academic performance in colleges.

Education is paramount and colleges, for example, integrate students from different academic backgrounds; integrating different approaches from the teacher and the students through collaborative learning would positively impact students understanding (British Psychological Society, 2005). The research study outcome explicitly advocated for change in teaching approach within the distinct colleges. Furthermore, it draws attention of the ministry of education and the entire academia to the jigsaw strategy in enhancing academic excellence in Saudi Arabian colleges.

Literature Review

The literature review analyzed what other researchers had found concerning the benefits of cooperative learning when compared with traditional, teacher-centered learning approaches. Through comparison of traditional learning and cooperative learning, readers would be able to deduce effects of cooperative learning on students' performance. The jigsaw cooperative learning strategy, was also described. The study incorporated findings from ERIC Database, Psycinfo, and Education Sources and the key words: cooperative learning, jigsaw, college students, traditional learning were used for the research. The literature review was composed of empirical findings on jigsaw implementation, jigsaw application, comparison between traditional and CL learning. Lastly, it discussed the education system in colleges in Saudi Arabia.

Cooperative Learning (CL)

Cooperative learning is a teaching approach in which small groups, each with learners of diverse levels of capability, use a range of educational activities to enhance their comprehension of a topic (Dyson & Casey, 2012). Cooperative education is one of the recent remarkable and productive areas of research, theory, and practice in learning. It denotes students functioning together to attain the objectives and the instructional events that organize the students' joint efforts (Gömleksiz, 2007). Cooperative education is learner-centered education and has been executed widely and fruitfully in English Language Teaching (ELT). According to Lv (2014), CL has become one of the most common approaches to language teaching in the world. Lv used secondary data to compile the findings supporting application of CL in learning English in China. The author demonstrated that the CL strategies had an optimistic influence on the college English education through the factual examples of the college English classroom environment. In her report, she concluded that CL strategies, such as Jigsaw Learning, Group Investigation, etc. that encouraged interaction between peers. "Have a positive effect on the college English

learning” (Lv, p. 1952). Lv also found that students who were exposed to CL strategies were more motivated and enthusiastic. Other advantages included an increase in communicative competence, language knowledge and skills, as well as a higher level of enthusiasm and cooperation within the class. Furthermore, advanced students were able to help those students whose fluency was less developed.

In a similar study, Hua (2014) found that cooperative learning had positive effects on students participating in a large-sized English class in China. Hua (2014) explored the feasibility and effectiveness of CL learning strategies in Chinese universities, through a pretest and posttest experiment, where two classes of over 100 students participated. One class was exposed to CL strategies, and the other was taught using more traditional, teacher-centered approach. Data was collected through the use of surveys and questionnaires, as well as a pretest and posttest assessment of speaking, listening, writing, reading, and vocabulary skills. Hua (2014) found that the experimental group, which had engaged in CL strategies, had higher scores in all domains, but especially in vocabulary, and listening and speaking skills.

Cooperative learning is not just a synonym for students learning in groups. A learning practice only qualifies as cooperative education to the degree that the key cooperative learning elements are encouraged, which are: cognitive complexity and the development of quality teamwork (Curseu, & Pluut, 2013). According to Cuseau and Pluut, cooperative learning facilitates the development of cognitive complexity in other words, the level and depth of knowledge a group has regarding a certain subject or area of knowledge. Quality teamwork has many aspects that CL can help develop in a group, including collaboration, cooperation, and group cohesion. Also, CL can be employed in any type of task that can be assigned to students in learning classes, project-based courses, or laboratories (Maceirasa et al., 2011).

Traditional Learning (TL) and Cooperative Learning (CL)

The core of cooperative learning is interdependence. Hsiung (2011) conducted a comparison on students' academic performance in both cooperative learning and traditional learning by using Taguchi Quality Indexes. The participants were 42 sophomore mechanical engineering students. The researcher divided the students into two classes, and each class had 21 students. The first group worked together on solving the tasks assigned to them. Whereas the second group worked individually. After using a T-test, the researcher found that the students who work in cooperative learning groups had higher grades compared to those students who worked alone. In addition, cooperation encourages interaction. Individuals within the team encourage each other and facilitate one another's efforts to learn together and to teach other students who may have difficulty with a subject or topic. On the other hand, traditional centered learning encourages independent learning. Both systems have positive and negative sides. Cooperative learning encourages teamwork, and because it creates an environment in which students not rely entirely on a teacher to give feedback and support, learners are able to identify their own strengths and weaknesses regarding their own learning. Thus, they depend less on teachers. However, the negative side of CL is that it requires more time and the learners' cooperation to succeed. Because it is based on students' engagement in material alone, and feedback from the teacher, traditional learning encourages individuals to be more self-reliant (Manning & Lucking, 1991).

Active learning techniques employ a more hands-on strategy, animation techniques, and jigsaw technique, which make learning more attractive. In addition, techniques such as project-based learning, inquiry-based learning, and problem-based education increase student's acquaintance and conceptual comprehension (Doymus, Karacop, & Simsek, 2010). Lately, between these techniques jigsaw and animation cooperative education have attracted the

awareness of school leaders, teachers, and educational researchers (Nan, 2014).

Researchers, such as Brown and McIlroy (2011) have stated that one of the differences between cooperative learning and more traditional learning approaches is that of the role of competition to motivate students. They stated that setting competitive goals enable students to compete. Therefore, in an effort to outdo their classmates, students are compelled to work harder. On the other hand, there is no competitive instinct in cooperative learning. Another difference between the TL and CL is that whilst the individual learning enables one to attain personal goals, there is nothing like personal goals in cooperative learning. In cooperative learning, the interdependence is positive; the students help each other to be better in academic performance. The students want to achieve certain academic goals together in cooperative learning.

Additionally, in an extensive analysis of research studies that gave a comparison among the three paradigms of learning, namely, individualistic, competitive, and cooperative learning, Peterson and Miller (2004) examined the quality of college students' experiences during CL. The participants in this study were 113 students in four sections of psychology course. The researchers used questionnaire to collect the data. After two weeks, the students responded. The researchers found that the best paradigm of learning was cooperative learning (CL). The research took place in a college setting whereby the researchers noted the experiences of students learning together and compared it to individualistic and competitive learning. Students who had cooperative learning experiences were more positive towards academic learning than the ones who did not have cooperative learning experiences. Additionally, they were more appreciative of the ideas and opinions of other students than the ones who did not have cooperative learning experiences. Moreover, the students in the cooperative learning group took part in controversial arguments about academic subjects, developed interaction skills, and had more academic expectations than students who learned in individualistic and competitive environments.

A variety of Cooperative learning strategies have been in empirical studies throughout the world, demonstrating a positive effect between cooperative learning and academic performance, as well as attitudes towards learning. As an example, Bahar-ÖzvariŞ, Çetin, Turan and Peters (2006) conducted a study in Turkey in which they examined the difference between cooperative learning strategy which is problem-based learning (PBL) and lecture-based learning. There were 150 students who participated in this study and the experimental group consisted of 67 students, while control group was 83 students in a mental health course. The students were divided randomly into control group and experimental group. The researchers used pre and posttests as well as using T- test to measure the differences between the two groups. Results showed that cooperative learning led to better academic performance ($T=0.00$) than individualistic learning ($T=0, 70$). Students functioned well when they cooperated with each other. The researchers observed that cooperation also increased motivation among students towards their learning. The students in the experiment group sought clarification, elaboration and justification from each other. In addition, it enabled the students to share argument roles, procedural knowledge and conceptual work.

The research has also suggested that cooperative learning can be effective in passive learning environments. This kind of learning depends on verbal lectures, the student's role is passive no activities during class time. Nen-Chen, Gladie, and Wu (2005) conducted an empirical study to examine if cooperative learning improves students' outcomes in passive learning environment or not. The sample in this study was 172 students in an intermediate accounting course at Hong Kong University. The students were randomly split into two groups; one group taught by cooperative learning (small group) and the second group taught entirely though lectures. The researcher used ANCOVA to compare the test results for the two groups. The results showed that the p value was 0.01 in favor of the experimental group. In addition, the

students who worked as groups outperformed students who were taught by using lecture.

Perkins and Saris (2001) also studied a group of students for four weeks. They studied the effects of the method of jigsaw learning and the traditional type of learning on the performance of students. They found that the students who used the jigsaw learning performed better on the exam given at the end of semester than the ones who used the conventional method, showing a 5% increase between pretest and posttest scores, compared to students who had received lecture-style classes alone. The reason is that cooperative learning “stimulates cognitive activities that promote knowledge retention and achievement” (Peterson & Miller, 2004, p. 127).

Over 500 research studies are available on the cooperative learning. Researchers such as Manning & Lucking (1991), Huang (2011), Brown and McIlroy (2011), Peterson and Miller (2004) all prove that cooperative learning is the best mode that teachers should employ in the current educational environment.

Effects of Different Cooperative Learning Strategies on College Students

Tsay and Brady (2010) conducted a case study on twenty-four participants in a communication research course for four months. The academic performance and involvement were the independent variable in this study. The researcher concluded by using surveys, experiments, and content analysis. After students responded in the survey the researchers collected and analyzed data, and discussed finding of the involvements. Also, the researchers used RATs to find the relationship between students' academic performance and involvements. The result showed that students who employed cooperative learning (group working) had good academic achievement. In addition, cooperative learning techniques were effective on students' outcomes in the application of principles, calculation, and gaining of knowledge. Finally, the results yielded that there was a significant relationship between student involvement in cooperative learning and academic performance ($\beta = 0.26$, $p = 0.01$). Like evaluation and

judgment, problem analysis, involvement, and identification of concepts are better with cooperative learning.

In the same school of thought, Jong and Chi (2006) found that cooperative learning structures such as Tournaments Games Teams (TGT) gave consistent results that were positive. For example, students who participated in the activities showed positive results on their achievements, mutual concerns, race relations, and other related variables. Furthermore, a research that Jong and Chi did on Student Teams Achievement Divisions (STAD) supported the fact that cooperative learning had a positive effect on the academic achievement of individual students. Huang (2011) gave an analysis of 46 studies that researchers conducted for a specific period of time. Among the findings that he examined, there were the positive outcomes that related cooperative learning with academic performance. He found that 63% of all the students showed better outcomes in individual academic performances in Social Sciences for cooperative learning. On the other hand, only 33% did not show any difference between the outcomes of cooperative learning and the other traditional learning methods. The achievements were 89% better with the students who adopted cooperative learning than those using the traditional methods of learning. The results fully supported the fact that cooperative learning had a positive impact on the academic excellence of the students.

Also, research shows that in terms of problem-solving skills, cooperative efforts produce the highest quality. The reason, according to Williams, Carroll and Hautau (2005), and Pai (2013) is that cognitive process functions improve. When students are in groups, there is an exchange of insights and information among the members of the group (Pai, 2013). They generate a variety of strategies to solve the problem, increase their ability to translate them into equations and develop an exchange of ideas that they share. What it means is that cooperative learning increases the ability of students to understand academic problems in a way that the traditional forms cannot.

Researchers that share the same thoughts are Williams and Carroll (2007). They investigated the progress of two students whose initial responses were unwilling to cooperate with each other. In the human development course the classroom had 22 students. The two participants were not friends prior to the instructions to sit next to each other and cooperate in assignments and other academic related issues. However, as time passed, both students began to enjoy the company of each other in terms of learning. At the end of the study, the findings revealed that both students had academic gains. There is a thrust in research about peer learning showing that when instructors ask peers to be in groups, it encourages them to have useful academic discussions and dialogues that benefit them. Their arguments also take a good course because they argue about opinions that promote more research among them than if they learn on individual terms.

Curscedieu and Pluut (2013) continued to state that many researchers focus on the individual benefits of cooperative learning, rather than on the whole group. Thus, they did a study on a group of 159 students. Their findings suggested that while all the group members benefited; the ones that benefit more than the rest were the group leaders that in most cases were more aggressive than their group members.

The consequence of the students seeking clarification, elaboration and justification from each other is good academic performance. Tsay and Brady (2010) stated that cooperative learning could produce an effect called motivational effects. Ning (2010), Tsay and Brady (2010), and Summers and Turner (2011) also stated that there was a very strong correlation between student academic achievement and their motivation. "The motivational capacity is a strong factor in the academic performance of a student" (Summers & Turner, 2011, p. 459). They encourage each other in their small groups and learn (Ning, 2010). There is a growing consensus among educators and researchers that cooperative learning produces a positive effect among

student in terms of motivation which increases academic performance. They suggested that the results not only applied to college students, but to all levels of education.

The role of teaches is different in the cooperative learning classroom from that of the traditional class. The teacher is the facilitator of learning in a cooperative learning environment. The teacher is there to help in the sharing of the knowledge that every group already has. He or she does not lecture. Collaboration makes sharing and the subsequent absorption of knowledge better than lecturing alone. Students share what they have learnt. In other cases, there are students who continue with the discussions after class. Thus, absorption of the knowledge is better than if the teacher lectures and there is no discussion.

Many studies continue to show that in contrast to the traditional methods of learning such as competitive and individualistic, cooperative learning leads to better academic performance of college students. In a study by Williams, Carroll, and Hautau (2005), the results reveal that many teachers and instructors in different settings such as Turkey, Taiwan, and America now employ cooperative learning in their classrooms. Koçak (2008), Wu, (2013), and Williams and Carol (2007) all agree that according to their observations, many schools in different settings now employ the use of cooperative learning.

Some of them support the premise that cooperative learning is productive with relation to all areas of content. Moreover, some suggest that despite abilities, races, or geographic locations, all students improve their academic performance as a result of employing cooperative learning (Koçak, 2008). Also, the findings suggest that even students who are high achieving and gifted benefit from cooperative learning. “The relationship between cooperative learning and academic performance of students remain the most researched educational innovation topic in the field” (Pai, 2011, p. 251).

Jigsaw Implementation

The Jigsaw is a CL strategy initially devised by Aronson (n.d). Students grouped into mixed teams of 4 or 5, identified as the home groups. Every student in the group becomes a specialist on one of the subheadings by analyzing their subject of expertise with others from different groups who had the similar subtopic (Karacop & Doymus, 2013). The learners then return to their home groups, and through conversation, assist the other team members become knowledgeable about their subject matter. They teach their team their obtained knowledge and learn the necessary topic information from their members. It is then subsequent with an evaluation that is given to students independently (Dollard & Mahoney, n.d; Bergom *et al.*, 2011). The jigsaw technique provides learners with the chance to be dynamically involved with the learning procedure. With multiple introductions to this approach, students must feel more at ease with their roles (Artut & Tarim, 2007). Some evaluation of the supportive group could boost its effectiveness by summing up accountability to every individual for the group's presentation (Thompson & Chapman, 2004; Maden, 2011). Jigsaw may be utilized for listening and reading communication and awareness activities, using suitable learning duties. Features of Jigsaw technique make it appropriate for improving two essential and associated teaching objectives that lead to reading comprehension (Jenkins *et al.*, 2003). The objectives are to create good learning environment and enhance learners' capacity of knowledge. The jigsaw technique encourages engagement, empathy, and listening by providing every member of a group a critical area to play in the educational activity. Group members ought to work jointly as a team to achieve a common objective. No group member can succeed absolutely unless everyone participates as a team (Aronson, 2014). CL also assists in developing students' meta-cognitive consciousness, and learning the material while teaching it to members in a small group (Meng, 2010; Frame, 2014). The jigsaw method can improve cooperative learning by ensuring each student accountable for

explaining a number of the material to the group. In this approach, students are members of two teams, the “jigsaw group” and the “home group” (Doymus, 2008).

The Benefits of Jigsaw

It is said jigsaw is able to improve students’ learning because of the following reasons: a) it is less intimidating for many learners; and b) it increases the number of student involvement in the classroom; c) it reduces the necessity for competitiveness; and d) makes students less dependent on the teachers as the expert in the learning environment (Qiao & Jin, 2010). The first highlighted benefit of jigsaw is less intimidation. In a teacher dominance-learning environment, teachers move on with fast learners making slow learners intimidated to ask questions. However, jigsaw presents a forum of discussion making student free to ask questions without feeling intimidated. The moment intimidation is minimized level of engagement improves. Improved level of involvement boosts learning of students and reduces competition since every student achieves their goals. One of the key advantages of the Jigsaw method and most other CL approaches is that they tend to reduce competition in the learning environment and boost the cooperation within the learners. Finally, the last highlighted benefit of jigsaw is that the teacher plays the role of a facilitator, helping students to problem solving and come to conclusions on their own, and work together to meet their goals. In a CL environment, the teacher doesn't need to explain everything; his or her role is more focused on guidance and keeping students on task. Thus, students have a greater individual and collective responsibility for learning the material (Dollard & Mahoney, n.d.).

Academically, the Jigsaw technique and other CL strategies assist learners not just academically, but socially as well. Manning and Lucking (1991) affirmed that learning in the group could lead to social advantages for students of heterogeneous cultural and accomplishment backgrounds. Jigsaw makes it likely for the pupils to work jointly to complete the task (Qiao &

Jin, 2010).

Cooperative learning in Saudi Arabia

The benefits of CL are overwhelming and it is currently being practiced in nations that were predominantly traditional learning oriented. Saudi Arabia is one of such countries that have depended on traditional learning system; however, CL is emerging. In Saudi Arabia, traditional learning is still predominant in the education system. Traditional teaching is concerned with dominance of the teachers, where the teachers are the managers of the learning situation. Power and accountability belong to the teacher and they play the role of mentor and decision maker. Learning is mainly linked to the classroom and is mostly competitive (Mohammad, 2004). Traditional learning differs from cooperative learning in tactical approaches. The cooperative learning is budding in Saudi Arabia in areas such as Makkah Jeadh, and Riyadh. However, other areas are still using the traditional teaching method.

Few studies have examined the potential benefits of CL in Saudi Arabia, and none specifically about Jigsaw strategy. One recent study into CL was conducted by Mohamed (2014) in Riyadh (the capital city of Saudi Arabia). The participants in this study were 20 students in a sophomore university level language and translation course. The researcher kept the students in one group to examine the students' development in writing skills. He used pre- and post- tests to determine the effectiveness of cooperative learning on students' writing skills. The data were analyzed by using Statistical Package for the Social Sciences (SPSS). The result yielded that the mean score in the pretest was (21.80), the posttest mean score was (33.33) and the p value was .001, suggesting that the cooperative learning approach was effective on student's writing skills.

Gubbad (2010) researched cooperative learning strategy for elementary students, studying mathematics in Makkah, Saudi Arabia. The goal of this study was to identify the effects of using cooperative learning on students' academic achievement and retention in mathematics class. The

participants in this study were 59 students at elementary school. The researcher divided the students randomly into two groups; the control group had 29 students and experimental group had 30 students. The control group taught by using lecture, but the experimental group was taught by using a learning together, cooperative learning strategy. After using an achievement test and T test, the results showed that cooperative learning had a significant effect on students' academic achievement. Their retention thereby the standard deviation in for control group was 0.87 and the experimental group was 0.72.

Awatef (2006) undertook an experimental study in Al- Alhasa city. The aim of this study was to examine the effectiveness of cooperative learning on linguistic performance in learning English. The sample in this study was 75 female middle school students in an English class. The students were assigned randomly into two groups; the experimental group was 37 students and the control group was 38 students. The control group taught by using a lecture and the experimental group was taught by using a mastery learning strategy in cooperative learning. The researcher used t-test to collect the results of the pre and posttests. The results showed that there were statistically significant differences as the p value was 0.05 for experimental group. In addition, the researcher noted that the students who worked in cooperative learning had better linguistic performance and attitude toward learning English.

There is a need for proper awareness sensitization of parties involve in education system. Every system has challenges and the society customs and cultures must be evaluated prior to introduction of new system. Saudi Arabia has not embraced the CL in the region due to many factors such as cultural, technology capacity and existing education systems (Mohammad, 2004). Elyas (2010) reported that in Saudi Arabia and the many areas of the Middle East educational reforms have come from America or other western countries, but on many occasions not been effective in the Arabic learning context. Elyas (2010) stated that this ineffectiveness could be the

result of the fact that traditional education has had such a profound impact on learning, that its influence can still be felt today, and that “these practices stem from Islamic religious education and Arab identity. Hence, a thorough analysis of the origin and nature of Saudi pedagogy is required before new models can be considered” (p. 137). Therefore, there is a need for scientific developments incorporated jigsaw learning in some areas of Saudi Arabia, but with an understanding and sensitivity to the unique nature of the Saudi Arabian learning context.

The initial part of this literature review examined the potential benefits of cooperative learning, while the second part examined the effects of cooperative learning on the academic performance of college students. This literature review also focused on the advantages of the Jigsaw strategy in particular, and concluded with a review of some of the important research that had been conducted in Saudi Arabia.

This literature review tended to fill the gap in research by analyzing how cooperative learning Jigsaw strategy applied to Saudi Arabia educational system. Saudi Arabia’s education system has been, and continues to be, dominated by traditional learning strategies. The benefits of jigsaw learning, have made it a suitable research topic to study concerning the Saudi Arabian learning context. As a result of changes in understanding of best practices in teaching, some parts of Saudi Arabia, especially larger, metropolitan areas, such as the capital, Riyadh, have increasingly worked to incorporate the cooperative learning approach into curriculum, such as learn together and group investigation. However, many regions away from the capital (especially those in the north of the country) still rely exclusively on a traditional, teacher-lead approach at the university level. This study was the first of its kind in the region, and thus is significant and timely.

Method

The purpose of this quantitative quasi-experimental study was to investigate the effect of the jigsaw cooperative learning strategy on academic performance of college students in Saudi Arabia. In this design, the participants were assigned to either the experimental group or the control group. The experimental group was taught using CL strategies. The other group, the control group, was not exposed to the independent variable and taught through more traditional strategies (Creswell, 2014).

Research Design

This study used a quasi-experimental research design. It is quasi-experimental because the participants were chosen through convenience sampling methods, rather than a true randomized sample (Creswell, 2014). This research, however, is an experiment because its goal is to determine the effect of the independent variable on the dependent variable under study. In this regard, the cooperative learning strategy was the independent variable, while student's performance was considered as the dependent variable.

Pre and posttest were used as data collection instruments. Four sets of pre and posttests were administered to both the experimental group and the control group, and the results were compared to determine what effect the cooperative learning strategy may have had on their scores. This section covers a number of methodologies that were adopted in the research.

Research Site

The study was conducted at a university in northern Saudi Arabia. This university was chosen partially for reasons of convenience, as the researcher is from the area where the university is located. Also, the researcher has a personal connection with the university because she graduated from the school. More importantly, as someone who graduated from the university, the researcher knows that cooperative learning strategies are not used in the classrooms. The

researcher requested access to the university while in the U.S. by sending a formal email to the dean of the university. Permission was granted, and a letter was sent to the U.S. by email to the dean, allowing the researcher to have access to the university to conduct research. The researcher then contacted a professor of Education in the university, who agreed to allow the researcher to do the study in her class.

Participants

The study sample involved 40 female students enrolled in education classes, ranging in age from 20 to 25. The study was conducted on females only because the colleges in Saudi Arabia are separated by sex. Two classes were selected to participate in this study. One class was the control group, and the other was the experimental group. Each class was comprised of 20 students. In selecting the study sample, the convenience sampling method was used. The study did not discriminate on any age segment, or level of ability since the study sample was selected irrespective of the age of the participants. Although the participants were selected through convenience sampling, they were randomly assigned either as the experimental group or the control group. The selection of the experimental group and the control group was arranged with the help of the professor who cooperated with the researcher in this study.

Instruments and Data Collection

The instruments for data collection included the pretest, posttest (see Appendixes 1, 2, 3, and 4), and a grading rubric for the test. The test items included multiple choice, closed questions and short answer “follow up questions.” The combination of the two types of questions helped assure that the students truly understood the questions being asked of them, as the open-ended questions were follow-up questions to encourage students to expand their answers freely. While it may be possible for some students to guess correctly, the justification of their responses in the open-ended questions allowed them to demonstrate that they fully understood the questions. In

addition, the grading rubric helped assure a standardization of the grading of the open-ended and short answer questions. Therefore, the study adopted this design of questions in order to reduce chances of random responses by participants, which were based on just guessing the most appropriate answers. The pre and posttest were identical and they were given before and after using the jigsaw strategy for experimental group. The same procedure applied to the control group in that the pre and posttest were given before and after the lecture. Both the pretest and the posttest were administered to both the control and experimental groups on both occasions once a week for each class, for four weeks. That means the total number of pre and posttests was 16 tests. Finally, the researcher compared the results from the pre and posttests between the two groups to see the change of student's performance after using the Jigsaw strategy or traditional teaching methods.

Procedures

The research was conducted over a period of four weeks, from the middle of December of 2014 to January, 2015. First, the researcher explained to the participants the purpose of the study and obtained their consent. The participants were given an informed consent package prior to participating in the study in order for them to understand their role and what was expected of them during the entire study. Once they agreed, the researcher worked with the professor to assure that one group of students was comparable in ability to another. The students were all in their sophomore year of college. Also, students' abilities were comparable since they undertook similar subjects and lessons. The researcher with the help of the professor divided the participants into two groups, group A was termed as control group while group B was referred to as experimental group. As the control group A was subjected to traditional/ lecture centered strategy, while group B was the experimental group that underwent jigsaw or cooperative learning strategy. The period of both classes was two hours. Afterwards, each student in the

experimental group B was assigned to a home group comprising of 4 students in which a set of reading selections were assigned to each student in the home group. Consequently, each student in the home group was assigned a number (1, 2, 3, or 4). Then, students with the same number from all the home groups were brought together to form new “expert groups.” A total of four expert groups were formed. In this regard, all students assigned the number 1 were placed together in one expert group, and those with the number 2 were placed in the second expert groups all the way to the fourth group.

Each student then was given a framework for managing their time on various parts of the jigsaw task. Pretests along with key questions were given to all expert groups for them to gather the required information in their particular area. Learning materials and resources pertaining to their topic were provided to each expert group for students to become “experts.” Finally, students were informed about the necessity to learn all content from one another in order to ascertain the effect of cooperative learning on their academic performance. However, for the group A that continued with the lecture-centered approach/ traditional learning, they were subjected to the same pre and posttests, which were collected for analysis. Since this is the tradition in the college, it was easy to analyze data from the control group through a similar process that included SPSS (Statistical package for Social Science). Finally, comparison of results from both control and experimental group created distinctive outcomes that explicitly illustrated the better learning strategy between lecture-centered/ traditional learning and jigsaw/ cooperative learning strategy.

Data Analysis

The Statistical package for Social Science (SPSS) was used to analyze the data in this study. In general, the SPSS significantly reduced the time typically needed for the sorting,

cutting and pasting of pretest and posttest records. Basically, the study applied the SPSS to data analysis, because it enhances reliability, validity, and objectivity to the study results.

Data confidentiality is an important factor that is expected by the respondents of any study (Oliver, 2010). To ensure confidentiality, participants were not identified in the study by name, and were instead referred to by number. The researcher did not allow any other person to see the names of the students who participated, or their names on the student work samples. The researcher will also destroy the data after the study is completed. Ethics have become a major cornerstone for carrying out meaningful and effective research. Before carrying out this study, every study participant was obligated to read and understand the provision of social research ethics. This fundamentally helped in minimizing the violation of rights of respondents during the study. Moreover, each participant was required to sign a voluntary form declaring that they agreed to operate within the scope of the research ethics, which lays emphasis on research integrity, friendly researcher-participant relationship, and above all non-violation of the institutional rights.

It is basic to always bear in mind that the responsibility of conducting research is to gain research information (Singh, 2006). In review, it was the responsibility of the researcher to protect all the participants involved in the study. This involved obtaining consent, protecting their privacy, and ensuring that they are protected from harm.

Results

The results of this study were based on pre and posttest data collected over four weeks. Eight assessments in total were administered during this time to get an accurate figure. This helped to give parallel results with no advantage bias on any side. The researcher used Statistical Package for Social Science SPSS for data analysis.

Interpretations of the Study

The data collected in this study showed that the students through both groups performed better on the post test results; however, the cooperative group had a comparatively higher increase. This conclusion may be drawn from the fact that the students from the cooperative learning group attained higher grades on the weekly post-tests as compared to the ones in traditional learning throughout the study. It is evident that in the control group, there was a statistically significant difference between the final weekly pre-test and post-test among the experiment group p value less than 0.05 (see Table 4). The test scores on the posttest increased to 5.2480 for the control group while the score of the experimental group rose to 6.0875 (see Table 2).

It should be noted that the results from the pretest from both the experimental group and the control group are similar. This implies that before the implementation of the jigsaw strategy there is no significant difference in performance of both groups. Both groups had just brief information on the topics that were being examined. This led to common low scores in both groups. There was little difference in the baseline data between the two groups. For example, the mean of the pre-test in the first week was 2.8250 (SD=1.24895) for the experimental group, and 2.7500 (SD=1.20852) for the control group. In the second week the mean of the pre-test score was 2.7500 (SD=1.16416) for cooperative learning groups, and 2.8000 (SD=1.11686) for the traditional group. In Weeks Three and Four the results of the pretests of the two groups were

very similar, the difference between the mean score of CL and TL was 0.025 (See Table 1)

Table 1.

Means for both Groups in Pre-test and Post-test (n=20)

	Groups	Mean	Std. Deviation	Groups	Mean	Std. Deviation	N
pretest1	CL	2.8250	1.24895	posttest1	CL	8.8000	1.17429
	TL	2.7500	1.20852		TL	7.8000	1.36111
pretest2	CL	2.7500	1.16416	Posttest2	CL	8.8000	1.15166
	TL	2.8000	1.11686		TL	7.9000	1.25237
pretest3	CL	2.8750	1.17960	Posttest3	CL	9.0000	95971
	TL	2.8500	1.25761		TL	8.0000	1.44186
pretest4	CL	2.9000	.92623	Posttest4	CL	9.1000	89736.
	TL	2.9250	1.09153		TL	8.1250	1.28631

CL=Cooperative Learning, TL=Traditional Learning, N= number

In Table 1, pre and posttest results indicated that students in the experimental group had a higher mean score compared to those of the control group. Week One: The control group had a similar score compared to the experimental group. The total mean for the pretest was 2.8250 for the experimental group and 2.7500 for the control group. In the posttest the traditional learning mean was 7.8000(SD=1.36111), which was lower compared to 8.8000(SD=1.17429), in the cooperative class.

Week Two: The pretest mean for the jigsaw class was 2.7500 and 2.8000 in the lecture class. In the posttest the cooperative learning group had similar results in Week One, which was 8.8000(SD=1.17429) for the experimental group, and the control group's score was 7.9000(SD=1.17429).

Week Three: Generally, the means for both groups who took the pretest were close to each other. The jigsaw class was 2.8750, and lecture class was 2.8500. However, in the post test

the experimental group's mean rose to 9.000, while the control group's mean score was 8.000.

Week Four: The pretest scores for both groups were almost identical, with a mean score of 2.9000 for the cooperative learning group and 2.9250 for the traditional learning group. In the fourth week the posttest results rose to 9.1000 as compared to the first, second, and third week for the cooperative learning group. For the traditional group, the mean was lower by, 975 compared to the cooperative learning group.

Table 2.

Difference of the experimental group and control group during 4 weeks

	Groups	Mean	Std. Deviation	N
Difference1	CL	5.9750	.41279	20
Pre1-	TL	5.0500	.51042	20
posttest1				
Difference2	CL	6.0500	.32036	20
Pre2-	TL	5.1000	.47573	20
posttest2				
Difference3	CL	6.1250	.31933	20
Pre3-	TL	5.1500	.40066	20
posttest3				
Difference4	CL	6.2000	.29912	20
Pre4-	TL	5.2000	.61559	20
posttest4				
Total	CL	6.0875	.1818	20
difference	TL	5.2480	.26283	20

The differences shown in the Table 2 above are calculated by subtracting the mean of the pretest score from the mean of the posttest score. The number of participants used in each group was 20 and their mean was calculated by dividing their total marks by their number. The standard deviation was calculated easily by calculating the mean of the students' results, then subtracting the mean and squaring the result. The average of those squared differences is the standard deviation as a measure of variability.

Table 2 showed that there existed a difference between the means of the scores on the tests in favor of the experimental group that underwent CL. The mean of the experimental group in the pre and posttests was roughly 6.0875, while it was 5.2480 for the control group. Also, the results of Table 2 showed the low standard of scores in the understanding of concepts by the control group as compared to the experimental group. Generally it can be seen from the table above that there were changes evident in the standard deviation and the total means between the two groups for four tests taken over the four weeks. The cooperative learning class was one point higher in the mean in all the four tests. In the standard deviation of the four tests the traditional class had over one point higher than the cooperative class. It is also noted that although the four tests were taken during different times of the four week period there was a difference in the scores as compared to the other tests in the control group. Different tests were used each week depending on content. However, the pre and posttest were always exactly the same to ensure consistency and help in derivation of a single mean accurate score. The test used for pre and post evaluation contained the same questions to ensure consistent evaluation. Each week a new set of matching pre and post tests were used based on that week's content. This outcome clearly confirms the effectiveness of cooperative learning in Saudi Arabia.

Figure 1.

The mean difference in pre and posttests of CL and TL groups during four weeks

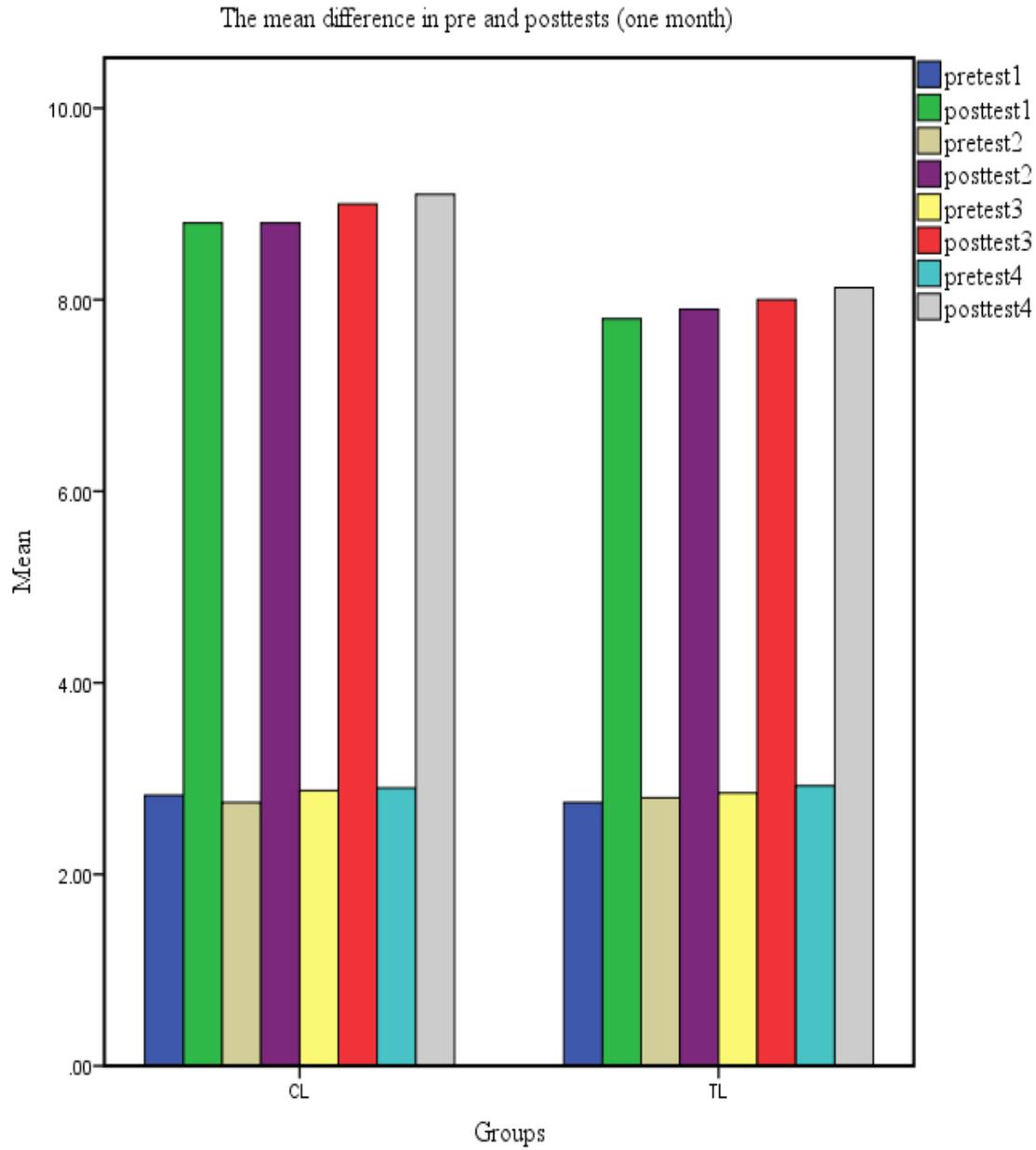


Table 3.

Independent samples T-Test of the experimental group and the control group

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Differ ence	Std. Error Difference	95% Confidence Interval of the Difference Lower Upper	
Difference1 Pre1-posttest1	Equal variances assumed	.089	.766	6.302	38	.000	.92500	.14679	.62785	1.22215
	Equal variances not assumed			6.302	36.4 07	.000	.92500	.14679	.62742	1.22258
Difference2 Pre2-posttest2	Equal variances assumed	5.60 1	.023	7.408	38	.000	.95000	.12825	.69038	1.20962
	Equal variances not assumed			7.408	33.2 93	.000	.95000	.12825	.68917	1.21083
Difference3 Pre3-posttest3	Equal variances assumed	1.93 4	.172	8.510	38	.000	.97500	.11456	.74308	1.20692
	Equal variances not assumed			8.510	36.1 99	.000	.97500	.11456	.74270	1.20730
Difference4 Pre4-posttest4	Equal variances assumed	17.2 06	.000	6.534	38	.000	1.0000 0	.15304	.69019	1.30981
	Equal variances not assumed			6.534	27.4 98	.000	1.0000 0	.15304	.68626	1.31374

Although Table 3, the data did not showed a significant differences in the respective tests of the classes in the first three tests, but on the fourth test there is a significant difference between the two groups. However, The F value brings out the differences between the assessments clearly. It is evident that as the tests were administered one after another in the month period there were positive improvements in both the groups. The F test results rose from 0.089 in the first test to 17.206 in the last test in the month. This indicates that for the first pre and posttest, there was no much improvement, but by the fourth week, the students had made tremendous progress on

the posttest, comparing to the pretest. This shows that the time period of one month is significant as the F value stipulates that the increase in time leads to improved results. Though the three weeks were not satisfactory enough to receive significant results, there was a gradual rise from the first test to the fourth test. The t test result also varies between the four tests. This is because the t test is used to evaluate if the sets of results from the cooperative learning class and the traditional learning class are different from each other. It can then be interpreted that the difference between the results of the two groups are different and the difference becomes greater up to the fourth test. There is an influence of time over the research test since the results mean difference rose from 0.925 in the test first performed to one in the last test performed.

Table 4.

The significance of the study

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	5028.806	1	5028.806	24617.667	.000
Groups	37.056	1	37.056	181.403	.000
Error	7.762	38	.204		

Table 4 showed the significant difference between cooperative learning and traditional learning. The significance of this study is $p < .001$ ($\text{sig} < 0.05$), that means there is a significant difference in students' scores between the two groups. These results suggest that cooperative learning has the capacity to improve students' academic performance, which is the hypothesis of this research study. In addition, cooperative learning improves students' performance through jigsaw strategies, and consequently the experimental group received better scores. Also, it is seen through the result that cooperative learning helps the students better understand the content of the subjects.

The results of this study demonstrated a difference between the academic performance of the experimental and control groups. The experimental group showed higher scores compared to

the control group. This difference may be because traditional learning does not typically allow students to become engaged and express their opinions.

Consequently, cooperative learning could be viewed as a superior approach that could benefit college students in Saudi Arabia, if implemented properly. In Saudi Arabia, conventional learning style is the regularly embraced system in school instruction. The research regarding CL has found that students benefit academically in comparison to the traditional method.

Subsequently, the research advocates that the colleges in Saudi Arabia ought to embrace the jigsaw technique so as to achieve the results stipulated in the research.

Conclusion

Discussion

This section of the study presents the findings in relation to the literature review. The results indicate that the students in the experimental group consistently scored higher on the post tests, compared to those in the control group. The results support the hypothesis of the study that cooperative learning has an overall positive effect of improving the academic performance of students. The difference between the pretest and the posttest scores for the experimental group were higher than those of the control group, which was taught by using traditional learning methods. The finding of the study is supported by the literature review, which indicates that cooperative learning improves the academic achievements of the students. This section will discuss the relationship among the literature review and these results, the hypothesis, the limitations of the study, and implications for future research.

Relationship of Literature Review and the Results

The present study found that the performance of the students in the experimental group improved after using cooperative learning as compared to the traditional approach. The research design was based on the work of previous researchers who employed similar pretest and posttest research designs to investigate the effectiveness of cooperative learning and the Jigsaw strategy on learning outcomes. These studies found that cooperative learning improved students' academic performances (Hua, 2014; Mohamed, 2014; Awatef, 2006; Gubbad, 2010). This present study yielded a similar conclusion, finding that students who were exposed to the Jigsaw learning strategy in instruction received higher posttest scores than the control group, which had received instruction through a more traditional, teacher-centered strategy.

Studies which used different methods and procedures of data collection and analysis found the same results as the present study (Tsay & Brady, 2010). The researcher found that students

who employed cooperative learning (group work) had good academic achievement. Lv (2014) found that CL has a positive effect on English-learning students and that it has led to more interactions than any other learning approach. The present study was also supported by Nen-Chen, Gladie, and Wu (2005), who conducted an empirical study in Hong Kong. They found that students taught by cooperative learning outperformed those who were taught by lectures. The variety of contexts that the cooperative learning strategy has been studied in, and its consistently positive results, suggest that educators should try to apply cooperative learning strategies in their own classrooms and curricula.

Relation to hypothesis

The study found that there was a significant increase in the scores for cooperative learning after four weeks. With the above results the study was able to test the hypothesis, which stated that cooperative learning would improve students' performance in Saudi Arabia and answered the research question that cooperative learning has a positive impact on college students' performance in Saudi Arabia compared to the traditional teacher-centered approach.

The researcher formed the hypothesis because its effectiveness emanates from a platform where the students converse with one another on the various topics. Students in a group have time to come to a conclusion where the discussion changes and challenges their ideas and opinions. This allows the generation of many answers which are assessed to determine the perceived solution. In addition, cooperative learning provides an opportunity for correction errors where the students analyze ideas to detect errors which the lectures might not allow. Critically, cooperative learning ensures that the students absorb the right concept for the content, a benefit that may not be realized by students in the control group. Cooperative learning proves a good platform for the manipulation of skill, knowledge, resources, and per previous studies where such an aspect attracts success to every member in the group.

Validity of the Study

The principle of validity is an essential part of the scientific study. Validity comprises of the entire experimental concept and evaluates whether the results obtained have all the characteristics of scientific research (Goodwin, 2010). However, there are different types of validity used to evaluate the study.

External validity. External validity refers to the process of examining results to ascertain whether there is any other causal relationship (Gravetter & Forzano, 2012). The use of the control group and randomization is essential in the reduction of external validity problems. As such, the study uses a control group, i.e., the students taught using traditional methods, and compared to the students who received the treatment of instruction using Jigsaw learning strategies. The use of the control group helped to show the causal relationship between cooperative learning and traditional learning. The study also focused on a particular population in order to prove the causal relationship. External validity was also maintained through the creation and administration of the pretest and posttest assessments. The pretest assessments were the same every week of the study for both groups, as was the posttest. Both the experimental and control groups received similar scores for each of the pretest assessments, which addressed subject matter that was new to each groups. Therefore, it was consistently demonstrated that neither the control group nor the experimental group had an advantage in background knowledge that would have resulted in higher scores on the posttest assessments.

Internal validity. Internal validity shows how the experimental design is structured and also encompasses all the steps of scientific research methods (Goodwin, 2010). The design of the methodology determines the validity of the results. The study uses a quasi-experimental research design and the pretest-posttest control group design. While these methods are important in detecting a relationship between phenomena, they are also a criticism of bias and cannot provide

information generalized for the whole population.

Content validity. Content validity, as defined by Goodwin (2010) measures how accurately the study presents its goals. In other words, it quantifies and measures every element of the construct. Content and construct validity are closely related to the current study because they measure the extent to which the information provided is correct. The study has content validity because it evaluates by using a t-test to determine the significant difference between the pre-test and post-test scores of the students according to the traditional and cooperative learning approaches. The control group and the experimental group both improve in this study. That shows the study is not biased to any group.

Reliability of the study

The idea behind the research is that the significance of the study can be replicated in other research (Gwet, 2014). A study with high reliability means that other researchers can perform exactly the same project under the same conditions and generate the same findings. Gwet (2014) reports that there are different forms of research reliability, and therefore, these types of research reliability are discussed in relation to the research.

Test-Retest Reliability. Test-retest reliability is a strategy used to measure the stability and reliability of the instrument over time (Weiner, 2003). The study uses the pretest- posttest and rubric designs which are considered more stable when comparing participants groups. The researcher has repeated the same pre and posttests for each group to ensure the test-retest reliability.

Internal consistency. Internal consistency defines the consistency of results delivered for a given test (Weiner, 2003). The measure ensures that various items used in measuring different constructs in the study produce consistent scores. The researcher provides internal consistency to the study by making sure that different constructs of students outcomes were adequately

measured and the results of both groups were convergent.

Limitations of the study

Although the researcher has produced results that meet the research objectives, several limitations related to the study still exist. Firstly, the study was conducted only in one place (Hail City) thus there was no comparison with other educational institutions within the city and region. The study was conducted in Hail city as the researcher has experience and personal knowledge of this college. The limitation, however, is that Hail City only has one college. Research conducted in larger or smaller universities, from different regions, may have yielded different results.

A very significant limitation to this study is the relatively small sample size, and how that sample was selected. First, the sample was not selected through a random sample, but through a convenient sampling due to the resources available. While steps such as obtaining pre-test data were taken, the classes could have had some advantage over another in terms of ability or the way that they were previously taught, which was not controlled for by the researcher. A larger sample, randomly selected, may have yielded more valid results.

Secondly, the study participants were female students aged 20 to 25 years, enrolled in education classes. This is because the colleges in Saudi Arabia are separated by gender, so no mixed classes are available. Therefore, data collected from this population may not be applicable to male students.

Thirdly, the study was limited in terms of the amount of time it took to complete. The study period was only four weeks and thus, the study may not have been as able to obtain conclusive results. A longer time spent in the field may have attained a greater difference between the pretest and posttest data, between the control and experimental groups.

Implications for future research

Although the study was able to achieve the purpose and objectives and answered the research question, the following are some of the implications for future research that must be considered by other researchers:

First, future studies need to look at other locations and other areas in Saudi Arabia to determine the implications of cooperative learning on the performance of students. Moreover, future studies should examine how cooperative learning affects the productivity and the impact on students' roles.

Secondly, future studies should focus on the long-term impact of CL on students' performance. This can be achieved by increasing the experimental period and follow up with performance of both the experimental and control groups for a period of one year or more.

Thirdly, the study participants were only females and came from one college. Future studies must incorporate both genders and determine the differences between males and females when it comes to cooperative learning. Future studies should also consider carrying out the study in different colleges, which have different settings and are located in different environments when determining the impact of cooperative learning on students.

Fourthly, this study was conducted on students' academic performance only. The researcher expects that cooperative learning impacts other variables. Therefore, other studies should focus on effectiveness of cooperative learning strategies on skills such as transmission learning effect, discovery, and problem solving.

Lastly, future studies can also look at the perceptions of students towards the cooperative learning strategy. This can be done by looking at their performance, their participation, enjoyment of the learning process, and what challenges they face when using cooperative learning strategies.

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Appendices

**Appendix A:
Pre/ Posttest 1**

Name:

Class:

Data:

Pre/ Post test

1- What does polytechnic education mean?

2- Write the word (True) or (False), with error correction if the sentence is wrong:

1 / Secondary education is the highest peak in France ().

2 / The period of middle school in France is five years ().

3 / French education focuses on intellectual and cultural matters ()

4 / One feature of French education calendar is realistic and continuous systems ()

4- What are the pros and cons of French Education Universities?

5- What are some attributes of French Education?

**Appendix B:
Pre/ Posttest 2**

Name:

Class:

Data:

1- Write the definition of:

Nursery

Primary stage

2- Write the word (True) or (False), with error correction if the sentence is wrong:

1 / Democracy and equal opportunities in education are part of the organization of French education ().

2 / Democratic approach does not affect the attributes of France education ().

3 / Economic situation has a strong impact on French education ().

4 / The period of studying high school in France is seven years ().

3- Fill in the blanks below:

* A famous university in France is.....

* The French revolution, tried to eliminate.....

4- What do you know about secondary education in France?

**Appendix C:
Pre/ Posttest 3**

Name:

Class:

Data:

Pre/ Post test

What do you know about the concept cartoons strategy?

When did you learn about the concept cartoons strategy?

What are the benefits of the concept cartoons strategy?

How can you apply this strategy in your classroom?

**Appendix D:
Pre/ posttest 4**

Name:

Class:

Data:

Pre/ post test

What are the differences between taking note and making note?

How can you evaluate the effectiveness of using the strategy of take note?

What are some kinds of taking note?

How can you apply taking and making note strategies?

Appendix E:**Students' scores in pre and posttests during four week (control group)**

TL (lecture class)	pretest1	posttest1	pretest2	posttest2	pretest3	post test3	pretest4	posttest4
student 1	3	8.5	1	7	4.5	10	2.5	8.5
student 2	2.5	7.5	4	10	1.5	7	4	10
student 3	2	6	2.5	8	2	7	2.5	8.5
student 4	4	9.5	1.5	6	3	8	2	7
student 5	3.5	8	2	7	4	9.5	4	9
student 6	4.5	10	2.5	8	1	6	2.5	8.5
student 7	2.5	8	3.5	9	2	7	2.5	7
student 8	4	9	5	10	1	6	4.5	9
student 9	1	6	3	8	4.5	10	1.5	6
student 10	3	9	2.5	7	1.5	6	3	9
student 11	4	9	4	9	3	8	1.5	7
student 12	3	8	2.5	8	4.5	10	1.5	6
student 13	5	10	5	10	2.5	7	2.5	7
student 14	2	7.5	3	8	2.5	8	3	8
student 15	1.5	6	1.5	6	4.5	9	3	9
student 16	3	8	3.5	8	2	7	2	7
student 17	2	7	1.5	6	4	10	5	10
student 18	1	6	2.5	8	2	7	2.5	7
student 19	1.5	6	3	8	4.5	9.5	3.5	9
student 20	2	7	2	7	2.5	8	5	10
Total	55	156	56	158	57	160	58.5	162.5
Average	2.75	7.8	2.8	7.9	2.85	8	2.925	8.125

Appendix F:**Students' scores in pre and posttests during four week (experimental group)**

CL (jigsaw class)	pretest1	posttest1	pretest2	posttest2	pretest 3	posttest3	pretest4	posttest4
student 1	5	10	2	8	3	9.5	3	9
student 2	4	9.5	3.5	9.5	3.5	9.5	3.5	9.5
student 3	3	9	2	8	2.5	8.5	4	10
student 4	4	10	2	8	3	9.5	1.5	7
student 5	4	10	4	10	4	10	2	8.5
student 6	2	8.5	3	9	3	9	3	9.5
student 7	1.5	7.5	4.5	9.5	3.5	9.5	4	10
student 8	4	9.5	2	8	3.5	9.5	3	9
student 9	3	9.5	3.5	9.5	1.5	7.5	1	7.5
student 10	4	10	4	10	1	7.5	4	10
student 11	3	9.5	3	9.5	2.5	8.5	1.5	8
student 12	2.5	9	4	10	4	10	3	9.5
student 13	2.5	8.5	3	9.5	4.5	10	3.5	10
student 14	2	8.5	4	10	1	7.5	4	10
student 15	2.5	8	3	9.5	3.5	9.5	2.5	8.5
student 16	4	10	2	8	0	7	3	9.5
student 17	0	6	3	9.5	3.5	9.5	2	8.5
student 18	1	7	1	7	2.5	8.5	3	9.5
student 19	3	9	0	6	4	10	2.5	8.5
student 20	1.5	7	1.5	7.5	3.5	9.5	4	10
Total	56.5	176	55	176	57.5	180	58	182
Average	2.825	8.8	2.75	8.8	2.875	9	2.9	9.1

Appendix G: IRB Human Subjects Approval

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI) HUMAN RESEARCH CURRICULUM COMPLETION REPORT Printed on 11/12/2014

LEARNER	Norah Alshammari (ID: 3852107)
DEPARTMENT	edu
PHONE	9712276549
EMAIL	nalshammari@fredonia.edu
INSTITUTION	SUNY - College at Fredonia
EXPIRATION DATE	11/01/2015

GROUP 1.

COURSE/STAGE:	Basic Course/1
PASSED ON:	11/01/2013
REFERENCE ID:	11674173

REQUIRED MODULES	DATE COMPLETED
Introduction	11/01/13
History and Ethical Principles - SBE	11/01/13
Defining Research with Human Subjects - SBE	11/01/13
The Federal Regulations - SBE	11/01/13
Assessing Risk - SBE	11/01/13
Informed Consent - SBE	11/01/13
Privacy and Confidentiality - SBE	11/01/13
Research with Prisoners - SBE	11/01/13
Research with Children - SBE	11/01/13
Research in Public Elementary and Secondary Schools - SBE	11/01/13
International Research - SBE	11/01/13
Internet-Based Research - SBE	11/01/13
Avoiding Group Harms - U.S. Research Perspectives	11/01/13
Vulnerable Subjects - Research Involving Workers/Employees	11/01/13
Conflicts of Interest in Research Involving Human Subjects	11/01/13
SUNY Fredonia State College	11/01/13

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

**Appendix H:
Hail University Approval Letter**

<p>Ministry of Higher Education University of Hail Vice Rector For Graduate Studies & Scientific Research</p>	 مكتب الوكيل Vice Rector's Office	<p>وزارة التعليم العالي جامعة حائل وكالة الجامعة للدراسات العلية والبحث العلمي</p>
<p>سعادة الملحق الثقافي في الولايات المتحدة الأمريكية سلمه الله</p> <p>السلام عليكم ورحمة الله وبركاته</p> <p>تهدي جامعة حائل لسعادتكم أجمل التحايا وأطيب التمنيات . نفيديكم بأنه تقدمت إلينا المبتعثة / نورة مسهوج الشمري والمتحققة في بعثة خادم الحرمين الشريفين والتي تطلب الموافقة على تطبيق دراسة تجريبية على طالبات جامعة حائل بعنوان (مدى فاعلية إستراتيجية البانوراما في التعليم التعاوني).</p> <p>نفيد سعادتكم بأنه لا مانع لدينا بتسهيل مهمتها .</p> <p align="right">وتقبلوا سعادتكم التحية والتقدير،،</p>		
<p>وكيل الجامعة</p> <p>لدراسات العليا والبحث العلمي المكلف</p> <p align="center"> أ.د عبدالله بن محمد الدوسري</p>		
<p>المرفقات : ٢ التاريخ : ٢٥/١/٢٢ الرقم : ٢٥/٢/٥٥٢٨٤</p>		
<p>المملكة العربية السعودية . حائل هاتف : ٥٢٥٨٢٢٠ - فاكس : ٥٢١٠١٩٢ - ٠٦ . ص.ب : ٢٤٤٠ حائل Saudi Arabia Hail Tel : 06 - 5358230 Fax : 06 - 5310192 Post Box No Hail 2440</p>		

Appendix I: Attendance Letter

KINGDOM OF SAUDI
ARABIA
Ministry of Higher Education
University of Hail
Faculty of Education

المملكة العربية السعودية
وزارة التعليم العالي
جامعة حائل
كلية التربية

سعادة الملحق الثقافي في الولايات المتحدة الأمريكية
سلمه الله

السلام عليكم ورحمة الله وبركاته

ترفع جامعة حائل إليكم هذا الخطاب وفيه تفيدكم انه تم حضور المبتعثة/ نورة مسهوج الشمري لجامعة حائل وتم تطبيق دراستها والتي بعنوان " تأثير استخدام استراتيجيه البانوراما(جيفسو) في التعليم التعاوني على أداء الطالبات الأكاديمي "على طالبات المستوى السابع تعاوناً مع الأستاذة / حسان التميمي في تخصص إدارة تربية. وكان ذلك بتاريخ 6 ديسمبر 2014 علماً بأن تاريخ انتهاء الدراسة 26 يناير 2015 .

وتقبلوا سعادتكم التحية والتقدير ,,

الأستاذة / حسان التميمي .
التوقيع

جامعة حائل
كلية التربية
فرع الطالبات