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Research Article

The Impact of Cooperative Learning on Student Achievements in Higher Educational Settings

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Abstract

With the growing consciousness that undergraduates are passive during instructional periods, the need for interactive methods increased. Cooperative learning has long been famous for school secondary and high school students but within these years it has become more active in higher education sessions. However, studies on the influence of cooperative learning in higher education are very minimal. The purpose of this study was to examine the impacts of cooperative learning on skill development of 35 first-year learners at the Modern University for Business and Science; and to evaluate the learners attitudes towards cooperative learning system utilized as a part of the Introduction to Educational Psychology classroom. The pretest was given to both experimental (N=35) and control groups (N=28) before using any method to evaluate their prior knowledge. Jigsaw system was utilized with the experimental group over an eight-week period. The researchers used quasi-experimental real life intervention. The instruments utilized were: questionnaire of attitude towards cooperative learning and the cooperative learning behavioral assessment form. Results showed that students who were taught using Jigsaw method showed better progress in success measures than those in the control group. In addition, the questionnaire showed positive opinion toward the use of jigsaw and they believed it promoted positive attitudes and inter-personal skills.

Keywords: Cooperative learning; Jigsaw system; Student achievements; Learning on student achievements

Introduction

At the university level, instructors struggle with the lack of students' interaction and the spread of passivity in the classrooms. In order to assure effective learning, universities need to focus on providing knowledge that is being exchanged between the learners and the teacher(s) in interactive modernized classrooms that suit the present era [1]. Learners in these environments are active participants and are constructors of their own knowledge; whereas teachers are the facilitators of the presented knowledge who focus on directing the teaching-learning process based on the pre-determined learning outcomes.

In the 21st century, various learning strategies have been developed and experimented in different educational settings (schools, colleges, universities, etc.) to promote active learning and enhance social interaction between peers. Among of which is the cooperative learning approach that involves small groups of students who work together and interact in order to solve and develop an understanding of the given task(s) [2]. Defined this approach as "an instructional strategy that employs a variety of motivational techniques to make instruction more relevant and students more responsible." [3] Indicated that five essential components should be present to form an effective cooperative learning group. These elements include: 1) a positive need for interdependence, 2) face-to-face interaction,3) individual and group accountability should take place to assure a fair share of work, 4) interpersonal and small-group skills should be used, 5) members should effectively work together as a group. Then team members are responsible for their teammates' learning and acquisition within their group.

[4] Peer interaction leads to improvement in learners' communication skills and collective problem-solving abilities [5]. Added that students also develop their interpersonal skills, content-knowledge and higher order thinking abilities when they communicate in their learning groups [6]. Implied that teamwork, communication, collaboration, leadership are also improved. Through this interaction, students learn how to inquire, share ideas, explain

differences, organize their ideas and construct new understandings [7]. Indeed, co-operative learning encourages learners to creatively share their experiences and be confident when reflecting accordingly.

The Jigsaw technique has been seen as the most flexible and the most studied and frequently used teaching method compared with the other cooperative learning strategies [8,9]. This cooperative learning method was recommended to be used for teaching social and science studies [10,11]. Indicated that cooperative learning techniques like the jigsaw method have different classroom benefits. These benefits might include fostering positive attitude and improving students' attitude toward the subject of study [12,13]. Students' achievement level may also be improved [10,13,14]. Thus, students will actively work together and assist each other when learning the given material, resulting into a developed learners' autonomy and self-directed learning [15,16]. There are six types of Jigsaw techniques the teachers may use in their classrooms: [8,9,17-20].

In their study, the researchers will use Jigsaw Classroom that was developed by [17]. This technique includes the following steps: 1) the students will be divided into groups; 2) group leaders will be assigned needed to provide guidance and follow up on the given tasks; 3) lessons will be divided into segments; 4) each student will be given a specific segment to work on; 5) "expert groups" will be joined together in order to discuss and comprehend the given segments; 6) students will be brought back into their original "jigsaw groups"; 7) each student will be asked to explain their segment to their group; 8) the instructor floats from one group to the other to facilitate and observe the learning process; and 9) the instructor will assess the students using various assessment tools.

Literature Review

Invented the Jigsaw Classroom method to reduce interethnic hostility and prejudice. Subsequently, several studies have been conducted to prove the efficiency of this technique at the primary, middle, and secondary school levels and at university level [12,21,22]. Results have shown that theoretical courses have been taught effectively when using this technique and the development of students' communication and critical thinking skills were attained [21,22]. Comprehensive meta-analyses have shown that cooperative learning strategies have led to higher academic achievement than competitive and individualistic classrooms [23,24]. A number of studies have been conducted to determine the efficiency of Jigsaw technique. For instance, [12] compared the effect of Jigsaw I technique [17] and traditional teaching on the academic achievement of university students. At the end of the experiment, students indicated that "Jigsaw technique increases success, encourages self-confidence, develops cooperation and interaction, makes students more active and encourage them to research" [12].

[25] Studied the effect of Jigsaw technique and that of classical teaching and learning method on the academic performance of the university students who took the "Principles and Methods teaching" course. Eighty students participated in this experiment and results showed that the Jigsaw technique has "more favorable findings on the academic performance of students than the traditional learning method" [25]. These results match the results of the previous studies that supported cooperative learning. From his findings, Kiliç suggested that the Jigsaw technique ought to be used at all of the educational levels while being carefully monitored by the instructors who should intervene when necessary in order to assure effective results. [26] applied Jigsaw technique on ninety-five students in two-college level English classes. Results showed that the Jigsaw technique reduced students' reluctance and anxiety to participate. They also added that group reading and discussions helped them in developing their own opinions.

Research Questions

Research Question 1: To what extent jigsaw method improves the students' achievement compared to lecturing and discussion?

Hypothesis 1: The use of jigsaw improves students' achievement more than students who study using lecturing and discussion.

Research Question 2: What are the learners' attitudes towards cooperative learning?

Hypothesis 2: Students have positive attitude toward cooperative learning?

Research Question 3: How much do they cooperate in the group?

Hypothesis 3: Students are cooperative when working in groups.

Significance of the study

Students who actively work within their groups tend to retain the discussed information longer than that if they were being presented in a different instructional way [9]. Several advantages have been linked to Jigsaw teaching technique. For instance, [27] indicated that learners are motivated to learn from their peers in their expert team. When they go back to their home team, they are encouraged to teach one another the material they have worked on in the expert team. As a result, this leads to active engagement of learners who are monitored and guided by their facilitators of instruction. The main aim of instructors is to encourage learners to inquire in order to construct their own understanding.

[28] Indicated that although the vast majority of studies that have been done on cooperative learning strategies were conducted on primary and secondary schools. A lot of educators have become

more interested in their implementation at the university level. Thereby, this had motivated the researchers to apply Jigsaw technique and study its effect on university Education students.

This study fills the gap and provides more information in regards to the effect of cooperative teaching method (mainly Jigsaw technique) on the achievement of first year education students at MUBS. A few studies on cooperative learning were conducted in the Middle East. Therefore this study, would add up to the methods of teaching that could be used in higher education.

Purpose of the Study

The goals of this research were (a) to evaluate the impact of the use of jigsaw on the study skills of students, (b) to understand the learners' attitudes towards cooperative learning, (c) to assess the level of cooperation in the groups.

Method

Thirty-Five new first-year students taking Introduction to Educational Psychology course participated in the study. All of the students were majoring in Education at the Modern University for Business and Science. All of them enrolled in the course of 3 credits in the first semester of 2015 academic year. Over a period of eight weeks, the instructor used cooperative learning method. Two types of assessments were implemented to collect the data: questionnaire of attitude towards cooperative learning, the cooperative learning behavioral assessment form. First, the participants were given a pretest of which the total score was 50 to be answered in 100 minutes. Results were later ordered from the highest to the lowest to identify the mean, median, and mode to help the researchers split the students to groups. The class was divided into 7 groups of 5 students each. The same test was re-given to the students after 2 months of teaching. Then, after each unit, participants sat for a quiz. They worked as a group in class but submitted the quizzes alone. Afterwards, the instructor identified individual scores and team grades to evaluate. The goal of these scores is to provide individual achievements. After, the participants filled in the questionnaire of ten items to identify their opinion toward jigsaw. Finally, the behavioral assessment form was distributed after each unit so that participants would evaluate the behavior of their group members.

Research design

The researchers used Quasi-experimental research design to collect the data. This strategy was selected since in this research all subjects are logically created as a whole group in one class [29]. The pre-test and post-test were given to the participants and more information is shown in the figure.

O1 X O2 - O4

O3

O1 = Pre-test of experimental group

O2 = Post-test of experimental group

O3 = Pre-test of control group

O4 = Post-test of control group

X = Treatment

-= No treatment

Figure 1: Research Design

Instrument

Multiple choices quiz was utilized to measure the participants' achievement. The researchers selected 10 items for each chapter quiz. There were 8 chapters, so the total numbers of questions were 80.

Experimental Procedure

The goal of this experimental process is to clarify how the investigations that were done in the classroom. The pre-test was distributed one day before the start of the cooperative strategy while the post-testwas conducted after the treatment process ended. The experiment (treatment) was held for 8 weeks (from the first week of November 2015 to the second week of January 2016). The eight topics of the lessons were given to the two groups (experimental group and control group). The researchers used jigsaw with experimental and lecturing and discussion strategy with the control group.

Technique of Data Analysis

The examination of the effect of jigsaw strategy on students' accomplishment is done by evaluating the average students' achievement's score in the groups. Data collected was examined using t-test. Before the treatment, both experiment and control groups were given the pre-test to identify undergraduates 'prior knowledge. The result sere shown in the table revealing that T-critical (1.97) is greater than T-calculated (-0.52) at 0.05 of significance which means their prior knowledge showed no significant difference.

	Levene's Test for Equality of Variances	t-test for Equality of Means	
	F Sig.	T	df
Pre-test			50
Equal variances not assumed		-0.508	47.184

Table 1: Independent Samples Test.

The table above shows t-test statistic revealed that t-critical (1.96) is greater than t-calculated (-0.51) which means there is no significant difference prior to the use of jigsaw method between the experimental and the control group.

Results

Research Question 1: To what extent jigsaw method improves the students' achievement compared to lecturing and discussion?

	N	Mean	Std. Deviation	Std. Error Mean
Post-test	35	82.26	2.27	0.384
	28	75.36	3.465	0.654

Table 2: Mean percentage scores of students in experimental and control groups.

The results of mean percentage scores of learners in experimental and control groups show that learners taught with jigsaw cooperative learning strategy had percentage mean score of 82.26 while those taught using lecturing and discussion had % 75.36. This shows that the experimental group did much better than the control group.

Research Question 2: What are the students' attitudes towards cooperative learning?

Question Number	Mean	Standard Deviation
1	3.87	0.88
2	4.08	0.83
3	3.85	0.8
4	3.88	0.97
5	4.13	0.82
6	3.65	0.89
7	3.75	0.84
8	3.73	0.72
9	3.48	0.92
10	3.33	0.99
Average	3.77	0.86

Table 3: Descriptive Statistics of Students' Attitudes towards Cooperative Learning.

Table 3 shows attitudes of the learners who are using cooperative learning for the first time. The statement that shows the highest mean are the 2nd, 5th, and 7th and the least they agreed on was the 10th. The average mean of attitude score for the experimental group learners was 3.77 which can be explained as having a fair conformity with this method.

Research Question 3: How much do they cooperate in the group?

Mean levels: 1.00-1.80	=	minimally agree
1.81-2.60	=	basically agree
2.61-3.40	=	Neutral
3.41-4.20	=	moderately agree
4.21-5.00	=	highly agree

Group	Mean	Standard Deviation
1	3.72	0.27
2	3.69	0.34
3	3.65	0.15
4	3.77	0.37
5	3.91	0.24
6	3.47	0.47
7	3.63	0.32
8	3.69	0.24
9	3.32	0.22
10	3.69	0.38
Average	3.64	0.32

Table 4: Descriptive Statistics of Students' Cooperative Learning Behaviors.

In order to evaluate the learners' cooperative skills, they were given the behavioral assessment form to fill at the end of the semester. They were requested to evaluate their friends who were in the same group using a five rating scale form. The results showed an average mean of 3.64 reflecting average level of cooperation. The highest mean was on item number five and the lowest was on item number nine.

Hypothesis

Null: There will be no significant difference between the achievement of students taught Teaching Learning Strategy using jigsaw cooperative learning strategy and that of those taught using group discussion strategy based on their mean percentage scores in Teaching Learning Strategy achievement test.

Teaching Strategy	Mean	SD	N	std	t-cal	t-crit	decision
jigsaw cooperative learning strategy	82.26	0.829	35	2.86	5.907	1.96	Reject H01
group discussion strategy	75.36	0.855	28				

Table 5: t-test analysis

Based on information presented in table 3, the t-test statistics showed that t-calculated (5.907) is greater than the t- critical (1.960) at 0.05 level of significance. Consequently, the null hypothesis is discarded. This shows that the learners using jigsaw strategy performed better than those taught using the other method.

Discussion

The finding of research question one revealed that the jigsaw cooperative learning strategy has main effect on first year students attending the Introduction to Educational Psychology course. The jigsaw cooperative learning method may be most efficient in large classes. The findings confirm [30] results stating that academic improvement is exhibited by the use of jigsaw in the classes. Students scored higher when using cooperative learning method.

Recommendations for Future Studies

The study examined the effect of the use of jigsaw on first-year learners attending the Introduction to Educational Psychology at MUBS. More studies are needed to further investigate the impact of cooperative learning method on achievement in various settings. The replication of the research could be conducted with other group of students attending the same course. It would also be of importance to examine how effective is cooperative learning on other subject matters. As this study is mainly based on Jigsaw model, future studies must stress on comparing two different methods of cooperative learning to identify which one is more effective [30].

Conclusion

Cooperative learning could increase students' attention, and permit them to express their thoughts. For learners who are timid, using cooperative learning would help them respond to assigned tasks, become more active, and listen to others. As for group leaders, they would listen to others and be more attentive. Jigsaw creates a relaxed setting for learning.

References

1. Report to the European Commission on improving the quality of teaching and learning in Europe's higher education institutions (2013). High Level Group on the Modernization of Higher Education.
2. Panitz T (1999) The Motivational Benefits of Cooperative Learning. New Directions for Teaching and Learning 78: 59-67
3. Johnson DW (1991) Cooperative Learning: Increasing College Faculty Instructional Productivity.
4. Earl GL (2009) Using Cooperative Learning for a Drug Information Assignment. American Journal of Pharmaceutical Education 73: 132.
5. Smith J and Spindle RM (2007) The Impact of Group Formation in a Cooperative Learning Environment. Journal of Accounting Education 25: 153-167.
6. National Association of EMS Educators (2005) Foundations of Education an EMS Approach. Mosby/JEMS.
7. Gillies R and Boyle M (2010) Teachers' Reflections on Cooperative Learning: Issues of Implementation. Teaching and Teacher Education 26: 933-940.
8. Doymuş K (2007) Effect of a Cooperative Learning Strategy in the Teaching of Phase and One-Component Phase Diagrams. Journal of Chemical Education 84: 1857-1860.
9. Hedeen T (2003) The Reverse Jigsaw: A Process of Cooperative Learning and Discussion. Teaching Sociology 31: 325-332.
10. Slavin RE (1980) Cooperative learning. Review of Educational Research 50: 315–342.
11. Meyers SA (1997) Increasing Student Participation and Productivity in Small-Group Activities for Psychology Classes. Teaching of Psychology 24: 105-115.
12. Maden and Sedat (2011) Effect of Jigsaw I Technique on Achievement in Written Expression Skill. Educational Sciences: Theory and Practice 11: 911-917.
13. Johnson DW, Johnson RT, Smith KA (1991) Cooperative learning: Increasing college faculty instructional productivity. ASHE–ERIC. Higher Education Report No. 4. Washington, DC: The, School of Education and Human Development, George Washington University.
14. Slavin RE (1983) When Does Cooperative Learning Increase Student Achievement?. Psychological Bulletin 94: 429-445.
15. Ghaith G (2004) Correlates of the Implementation of the STAD Cooperative Learning Method in the English as a Foreign Language Classroom. International Journal of Bilingual Education and Bilingualism 7: 279-294.
16. Zuheer KM (2008) The Effect of Using a Program Based on Cooperative Learning Strategy on Developing Some Oral Communication Skills of Students, Sana'a University, A Thesis Submitted for the Fulfillment of the M. A. Degree in (TEFL).
17. Aronson A (1978) The Jigsaw Classroom. Beverly Hills, CA: Sage.
18. Slavin Robert E (1982) Cooperative Learning: Student Teams, What Research Says to Teachers. Professional Library National Education Association, Washington, DC.
19. Stahl R (1994) Cooperative Learning in Social Studies: A Handbook for Teachers. Menlo Park, CA: Addison-Wesley.
20. Holliday and Dwight C (2000) The Development of Jigsaw IV in a Secondary Social Studies Classroom. Paper presented at the 2000 Midwest Educational Research Association (MWERA) Annual Conference in Chicago, IL.
21. Maloof J and White VKB (2005) Team Study Training in the College Biology Laboratory. Journal of Biological Education 39: 120-124.
22. Peterson ES and Jeffrey AM (2004) Comparing the Quality of Student's Experiences During Cooperative Learning and Large Group Instruction. The Journal of Educational Research, 97: 123-134.
23. Dansereau DF and Johnson DW (1994) Cooperative Learning. In: D. Druckman, R. A. Bjork (Eds.), Learning, Remembering, Believing: Enhancing Human Performance (pp. 83-111), DC: National Academy Press, Washington.
24. Johnson DW and Johnson RT (1989) Cooperation and Competition:

Theory and Research. Interaction Book Company.

25. Kiliç D (2008) The Effect of the Jigsaw Technique on Learning the Concepts of the Principles and Methods of Teaching. World Applied Sciences Journal 4: 109-114.
26. Mengduo Q and Xiaoling J (2010) Jigsaw Strategy as a Cooperative Learning Technique: Focusing on the Language Learners. Chinese Journal of Applied Linguistics 33: 113-125.
27. Tamah Siti M (2007) Jigsaw Technique in Reading Class of Young Learners: Revealing Students' Interaction. Online submission.
28. Herrmann KJ (2013) The Impact of Cooperative Learning on Student Engagement: Results from an Intervention. Active Learning in Higher Education 14: 175-187.
29. Shadish W, Cook T, Campbell D (2002) Experimental Quasi-Experimental Design to Generalize Causal Inference. Houghton Miffin, Boston.
30. Aronson E (1971) History of the Jigsaw Classroom. Retrieved from The Jigsaw Classroom.