

The Effectiveness of Jigsaw Strategy on the Achievement and Learning Motivation of the 7th Primary Grade Students in the Islamic Education

Dr. Mahmoud Jamal Al-Salkhi

Assoc. Prof. of Curriculum and Teaching Methods of Islamic Education
Educational Sciences Division
Petra Private University
Jordan

Abstract

This study aimed at getting perception of the effectiveness of Jigsaw Strategy on the achievement of the 7th primary grade students and their learning motivation. The study sample consisted of 53 female students: 26 students in the Experimental Group, and 27 students in the Control Group. In order to achieve the study objective, the achievement test and the motivation learning scale of the Islamic Education were used. Also, the teaching material pertaining to Jigsaw strategy was prepared. After confirming the confidentiality and reliability of the study, it has been concluded that a statistical indicative difference ($\alpha = 0.05$) does exist between the average scores of the two groups of female students in the Islamic Education achievement test and the learning motivation scales. The study results were in favour of the Experimental Group. Also, the study results showed the existence of a positive relationship between the achievement of the 7th primary grade students and their learning motivation.

Keywords: Islamic Education, Cooperative Learning, Jigsaw 2

Introduction

Cooperation is an important feature in Islam which urges individuals to cooperate together to do the right deeds. Allah said: (Help ye one another in righteousness and piety, but help ye not one another in sin and rancour: fear Allah. for Allah is strict in punishment) (Al-Maeda Chapter: 2). Prophet Muhammad (Peace Be Upon Him) has applied the cooperation with his companions in building the Masjed, digging the trench and others. Ibn Khaldun says in his Introduction: "Man is civilized by nature"; it is not imagined {the man} to be isolated from others since he needs to deal and cooperate with them.

As a reaction to the new developments of teaching process and educational elements during the last years, educators started reconsidering the teaching methods and strategies used in schools. Their study approach was based on the significant increase of students and the changes forced by the modern educational directions of the era technology that focuses on the teacher as the center of the teaching process and on the learner as an effective individual rather than a figure (Al-Heela 2002).

The second half of the 20th century witnessed an increasing interest in cooperative learning due to its effective role in the educational field covering public schools and universities. Studies of cooperative learning continued and became one of the most educational topics that encourages research and study. These studies have confirmed the effectiveness of the cooperative learning due to its achievement of excellent learning patterns.

The educational literature has noted that the student can learn from his classmate as he learns from his teacher even better. Learning accomplished through team activities is more beneficial and effective (Fitzgerald, Bouck, 1993). The Roman philosophers summarized the idea of cooperative learning as follows: when you teach you learn twice. This means that the teacher gets the first benefit when teaching his students, and second benefit by learning from his students (Mansi, et al 2002).

The strategy of cooperative learning has many advantages. It improves creative and logical thinking of students and helps them solve their problems. Also, it requires students to diversify learning sources, encourages team reaction and exchange of their experiences. In addition, cooperative learning provides students with learning incentives, creates self-confidence, and requires them to practice high level of organized thinking skills (Kagan, 2000).

These advantages were confirmed by (Tobin, Tippins & Gallard, 1994) through their intensive reviews of research studies regarding cooperative learning. Although cooperative learning can not solve all problems, its value is due to the fact that it provides students the opportunity to express and defend their opinions. Also, cooperative learning allows the student to share his ideas with his classmates and respect their points of view. Also, the new cooperative strategy considers students the center of the learning process, and thus it develops the individual as well as team responsibilities.

It should be noted that cooperative learning has some negatives. For example, team members might share incorrect concepts or information in the absence of the teacher's supervision. Also, feeling of high performer students with superiority or low performers with frustration might create individual discrimination among team members. Additionally, discussion of team members should be conducted in a friendly learning environment and be carefully monitored and controlled, otherwise, teamwork would be waste of time.

Jigsaw 2 Strategy

In spite of the advantages of cooperative learning, the educators and psychology scientists working at Austin schools in Texas state have created a developed method for cooperative learning called Jigsaw similar to the structure of a game that carries the same name "Jigsaw". The main purpose of this new learning method is to develop close relationships between students of British, Spanish, and Black ethnics in order to minimize ethnic tension.

The pioneer of Jigsaw strategy is called Arnsen (1978). Later, it was developed by Slave (1980) who designed a modified pattern of cooperative differential integration of information called (Jigsaw 2). In this strategy, students are divided into heterogeneous groups, each group consist of 4-5 members. In this strategy, the members of each group study the same subject, for example, a chapter in a textbook and each member concentrates on a specific part of the subject. After that, the members of different groups assigned the same part hold a discussion meeting. After that, each member joins his original group to explain to them what he has learned from his specific assignment. Finally, each member takes an individual test and all member scores are used to calculate each group's score (Al-Salkhi, 2009).

The Jigsaw strategy 2 is considered an image of cooperative learning by which students learn through their activities within small groups. Each member specializes in a specific portion of the study subject and then he shares the acquired knowledge with the other members of his group. The design of Jigsaw model has three main stages (Albaghdadi, et al, 2005):

A) **Planning stage:** which contains three steps

1. **Purpose identification:** the main purpose of Jigsaw strategy is to acquire the organized knowledge through specialty groups. Also, the necessary behavioral objectives of each study subject need to be identified.
2. **Designing study material:** the teacher is responsible for preparing the study material and tools such as textbooks, references, articles, video tapes, drawings, etc.
3. **Grouping the students** according to their interests, previous experience, and achievement level. However, the group should be heterogeneous to enable low performers learn from high performers.
4. **Designing evaluation tools:** the teacher should prepare a test in view of the identified behavioral objectives that cover all study subjects.

B) **Implementation stage** of Jigsaw 2 strategy that consists of four aspects (Table 1).

Table (1): The Main Aspects of the Implementation Stage of the Jigsaw 2 Strategy

Aspect	Description
Grouping of Information	<ul style="list-style-type: none"> • Distributing students into small groups. • Distributing subjects to individual students of each group to assume the role of expert in the assigned unit. • Studying the subjects based on the expert reports.
Meeting Experts	<ul style="list-style-type: none"> • Meeting of experts assigned the same unit to discuss its elements and compare notes given by experts.
Team Reports	<ul style="list-style-type: none"> • In their meeting, experts prepare a report covering the main points of the subject to share them with their group members.
Assessment and Evaluation	<ul style="list-style-type: none"> • Direct the work of groups and develop their concepts. • Monitor students' activities and get teachers involved in the group work. • Encourage students by using immediate enforcement and feedback.

C) **Evaluation stage** of Jigsaw 2 strategy that consists of three main levels (Table 2)

Table (2): The Three Basic Levels in the Evaluation Stage of the Jigsaw 2 Strategy

Process	Description
Group Evaluation	<ul style="list-style-type: none"> • Determining the work progress of groups and students' participation in the teamwork.
Evaluation of experience progress	<ul style="list-style-type: none"> • Determining the student's progress in the experts' group and as a member in his group.
Evaluation of material comprehension	<ul style="list-style-type: none"> • Giving students a written exam to determine each student's progress in meeting the learning objectives.

Due to the importance of cooperative learning strategies in general and Jigsaw strategy in specific, a number of studies have been conducted. These studies aimed at realizing the effect of these strategies on the students' achievement, thinking, motivation, etc. in different study materials and various study stages. Such studies include (Maden, 2011) who made a comparison between Jigsaw strategy and the conventional method with regard to the development of written expression skills. It was found that there was no significant difference between the two methods. In Turkey, a study conducted by (KOÇ, et.al.2010) concluded that teaching Chemistry using Jigsaw method was more effective in enhancing students' achievement compared with the conventional method. Another study conducted by (Mengduo, Xiaoling, 2010) tried to examine the effectiveness of using Jigsaw 2 strategy in teaching the English language. The results showed motivation and reinforcement of students' participation. Also, the results of Abu-Snina (2008) study supported the results of the above study. In addition, the results of a study conducted by (Souvignier s, Kronenberger, 2007) revealed that a group of the 3rd primary grade students who studied an Astronomy unit using Jigsaw 2 method showed higher performance than the control group students who followed the conventional method.

Another study was conducted in Turkey by (GÖMLEKSİZ, 2007) aimed at enhancing the Engineering students' knowledge of English language vocabulary and phonetics. The applied Jigsaw method showed positive learning results compared with the conventional method.

Whereas, the study of Al-Hadeed (2004) aimed at comparing the effect of using the cooperative learning with that using the conventional method in the achievement of the 9th primary grade students in the Islamic Education. In order to support Al-Hadeed study, a random sample was selected consisting of 154 male and female students. Her study showed the existence of a statistical indicative difference between the achievement of the experimental group and the control group due to the learning method, and in favor of the cooperative learning.

It is noted that previous studies focused on teaching Islamic Education using the normal cooperative method. Whereas, the present study emphasized the Jigsaw strategy in teaching the Islamic Education and investigating its effect on the learning achievement and motivation, and trying to find a correlation between them.

Statement of the Problem

The study problem emerges from the keen interest of the researcher and his critical need for a strategy in which the learner has an effective role in the learning process which focused on his achievement and motivation. The researcher believes that Jigsaw 2 strategy satisfies this need. This problem can be formulated in the following main question: What is the effect of using Jigsaw Strategy on the achievement of the 7th primary grade students and their learning motivation? From the previous question, the following sub-questions arise:

1st Question: Is there any statistical indicative difference ($\alpha = 0.05$) between the average achievement test scores of the female students in the Experimental Group and Control Group attributed to the teaching strategy (Jigsaw vs. Conventional)?

2nd Question: Is there any statistical indicative difference ($\alpha = 0.05$) between the average motivation scores of the female students in the Experimental Group and Control Group attributed to the teaching strategy (Jigsaw vs. Conventional)?

3rd Question: Is there any statistical indicative correlation at level ($\alpha = 0.05$) between the learning achievement and motivation of the female students of the 7th grade?

Objectives of the Study

The present study aimed at meeting the following objectives:

- 1- Get knowledgeable of the effectiveness of Jigsaw strategy in teaching the Islamic Education to the 7th primary grade students.
- 2- Discover any differences in the achievement of the 7th primary grade students in the Islamic Education attributed to the teaching strategy.
- 3- Discover any differences in the motivation level attributed to the teaching strategy.
- 4- Discover if there is any correlation between achievement and motivation in learning the Islamic Education course.

Significance of the Study

The significance of the current study comes from the following:

- 1- This study is distinguished by its genuineness as it is the first time this research is conducted in Jordan.
- 2- It helps teachers and supervisors get familiar with Jigsaw 2 strategy for possible application, if proved effective.

Limitations of the Study

- This study is applied only on the female students of the 7th primary grade at the Universal Schools in Amman, Jordan.
- The study is limited to the 5th unit of Islamic Fiqh in the second part of the Islamic Education textbook. This unit is part of the curriculum of the 7th primary grade for the scholastic year 2013/2014.

Methodology of the Study

In this study, the researcher used a semi-empirical procedure to investigate the effectiveness of Jigsaw strategy in the achievement and motivation of female students of the 7th primary grade in the Islamic Education course.

Study Sample

A sample of (53) female students of the 7th primary grade was intentionally selected from the Universal Schools in Amman, Jordan due to the cooperation and interest of the school administration and the teacher of the Islamic Education course in applying this experiment. The sample was distributed into two groups. The first one consisted of (27) female students and was considered an Experimental group that used Jigsaw 2 strategy. The second one consisted of (26) female students and was considered a Control group that followed the conventional method.

Study Tools

*Teaching by Jigsaw

The study material taught by the Jigsaw Strategy was prepared according to the following schedule:

- Lesson Identification: the researcher has chosen lessons from the 7th grade Islamic Education book/Islamic Fiqh Unit/Second Semester.
- Identification of the requirements of the learning process and the appropriate class atmosphere.
- Preparation of a lesson plan to identify the teacher/learner role based on Jigsaw Strategy, and to train the students using the cooperative learning.

• **Achievement Test:** It was designed to measure the achievement of the female students of the 7th prime grade in the Islamic Fiqh unit. The purpose of this test is to compare the effectiveness of using the Jigsaw strategy 2 with that of the conventional method.

The content of the Fiqh unit was analyzed, and the behavioral objectives were identified and formulated to cover all aspects of the unit content according to the Bloom classification. After that, the specification table was prepared, and the multiple choice test items (20) were formulated objectively. It was taken into account that the test includes items that measure the behavioral objectives at three levels (knowledge, comprehension & upper mental levels). To confirm the credibility of the test, its items were reviewed by a number of faculty members at Petra University and the supervisors of the Islamic Education course. Also, consistency coefficient was calculated using the formula of Codar Ritchardson (KR 20) and found to be (0.91) which was suitable for the purpose of this study. Additionally, the difficulty coefficient was also calculated for each test item, and the results were in the range of (0.19-0.82). The discrimination coefficient was also calculated for each test item, and the results were in the range of (0.27-0.30) which is considered acceptable for the purpose of this study.

• Measure of Motivation to Learn Islamic Education

The researcher developed a measure and wrote its items by referring to the educational literature with regard to the learning motivation, and reviewing some motivation measures. Finally, the measure was formed of 30 items. Its credibility was confirmed by referees of psychology, and its consistency was calculated as (0.93) using the formula of Cronbach Alfa.

Study Procedure

The study was carried out according to the following steps:

- 1) Preparing the teaching material used for the two study groups.
- 2) Applying Jigsaw strategy on the experimental group prior to the execution of the experiment by teaching three lessons of the unit previous to Al-Fiqh unit. This will give the students the opportunity to get familiar with the new strategy.
- 3) Preparing both pre-test and post-test as well as the motivation measure to determine the students' achievement and motivation to learn the Islamic Education.
- 4) Following up by the researcher on the teachers' classroom activities for both groups.
- 5) Applying the pre-test and post-test on the experimental and control groups.
- 6) Teaching the experimental group using Jigsaw strategy.
- 7) Teaching the control group using the conventional method.

Study Design

Independent variables: have two levels A) Jigsaw Strategy B) Conventional Strategy

Dependent variables: have two levels A) Learning Achievement in the unit of Islamic Fiqh
B) Motivation to learn Islamic Education

Statistical Treatment

The statistical package for the social sciences (SPSS) was used in analyzing the study results.

The following statistical treatments were used: Arithmetic Means, Standard Deviations, Formula of Codar Ritchardson (KR 20), Formula of Cronbach Alfa, ANCOVA, and Person Coefficient.

Study Results and Discussions

The results of the 1st question that states: Is there any statistical indicative difference ($\alpha = 0.05$) between the average post-achievement test scores of the female students in the Experimental and Control Groups attributed to the teaching strategy (Jigsaw vs. Conventional)? To answer this question, the Arithmetic Means and Standard Deviations of the pre-achievement and post-achievement test scores of both groups have been calculated as shown below:

Table (3): Arithmetic Means and Standard Deviations in the pre and Post Tests for the Two Study Groups

Test	Experimental	Group	Control	Group
Pre-Test	Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
	9.21	11.12	8.13	13.66
Post-Test	16.74	12.58	12.29	11.78

The above table shows that the Arithmetic Means of the scores of the two groups in the post-achievement test are (16.74 & 12.29). This indicates an apparent difference between the Arithmetic Means of the two groups. In order to explain this difference, the individual contrasts (ANCOVA) was used, and the next table shows the analysis results.

Table (4): Results (ANCOVA) for Female Student's Grades in Post test Achievement for the two Study Groups

Contrast Source	Sum of Squares	Free Scores	Mean of Squares	F	Indication Level
Pre-Test	472.51	1	472.51	2.31	0.332
Teaching Method	7285.4	1	7285.4	25.672	0.000*
Error	13911.557	51	201.616		
Total	21498.833	53			

* Function at indication level ($\alpha = 0.05$)

The above table shows statistical indicative differences in the Arithmetic Means of the post-achievement test scores of the two female groups. These differences are mainly due to the teaching strategy (Jigsaw vs Conventional) and are in favor of the Experimental group who studied through Jigsaw strategy. These results are attributed to the new learning environment provided by Jigsaw method that helps students develop their knowledge based on a variety of resources such as: library, Internet, and computer. Such resources are not made available through the conventional method. In addition, Jigsaw emphasizes the interaction between the individual students of the heterogeneous group which is usually followed by discussions between the members of the same group. Therefore, Jigsaw 2 strategy has a great effect on understanding the study material. Also, this strategy helps high achievers to communicate knowledge to low achievers. These results agree with the study results of Al-Hadded (2004), Abu-Snina (2008), Souvignier & Kronenberger (2007), Mengduo & Xiaoling (2010), KOÇ, et.al (2010) and Gomleks IZ,2007 (2007). Whereas, Maden (2011) does not agree with these results.

The results of the 2nd question that states: Is there any statistical indicative difference ($\alpha = 0.05$) between the average motivation of the female students of the experimental group and those of the control group to learn the Islamic Education which could be attributed to the teaching strategy (Jigsaw vs Conventional)? To answer this question, the Arithmetic Means and Standard Deviations of the motivation scores of both groups have been calculated (Table5).

Table (5): Arithmetic Means and Standard Deviations of the Motivation Measures to learn Islamic Education for the two Study Groups

Test	Experimental Group		Control Group	
	Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
Pre-Test	2.22	0.601	2.14	0.553
Post-Test	3.98	0.712	1.87	0.496

Table (5) shows the Arithmetic Means of the post-motivation test scores of the two groups as (3.98 & 1.87). This indicates a clear difference between the two Arithmetic Means of the two groups. To investigate the statistical indicative difference between the two Arithmetic Means, the analysis of the individual contrasts (ANCOVA) was applied as shown in Table (6).

Table (6): Results of Analysis of (ANCOVA) for Female Students’ Grades on a Scale of Motivation to Learn Islamic Education for the two Study Groups

Contrast Source	Sum of Squares	Free Scores	Mean of Squares	F	Indication Level
Pre-Test	0.200	1	0.200	0.470	0.236
Teaching Method	27.339	1	27.339	67.493	0.001*
Error	21.195	51	0.307		
Total	48.612	53			

*Function at the indication level ($\alpha = 0.05$)

The above table shows statistical indicative differences in the Arithmetic Means of motivation scores of the two groups in learning the Islamic Education. These differences are mainly due to the teaching strategy (Jigsaw vs Conventional) and are in favor of the experimental group who studied through Jigsaw strategy. Also, this strategy promoted female students’ activities and motivation to learn the Islamic Education. Also, it enforced their self-confidence and enhanced their achievements. This conclusion agrees with the study results of Kagan (2000) and (Mengdue& Xiaoling (2010).

The result of the 3rd Question that states: Is there any correlation that has statistical indication at the level ($\alpha = 0.05$) between the learning achievement and motivation of the 7th primary grade to learn Islamic Education? To answer this question, the correlation coefficient of Person was used to find if there is any linkage between the scores of the 7th grade female students in the post-achievement test and their motivation scores in learning Islamic Education as illustrated in the following (Table 7):

Table (7): Pearson Correlation Coefficient between Academic Achievement and Motivation to Learn Islamic Education

Learning Achievement	Learning Motivation	“R” Value	Indication		
Arithmetic Mean	Standard Deviation				
14.81	17.181	2.91	0.924	0.488	0.001*

* Function at the indication level ($\alpha = 0.05$)

The above table shows a positive value (0.488) of Person’s correlation coefficient. This value indicates a positive correlation between learning achievement and learning motivation. This result can be explained by the fact that Jigsaw 2 is proved to be effective in promoting learning motivation which leads to increasing learning achievement.

Recommendations

In view of the study results, the researcher recommends the following:

- Conducting more studies aiming at discovering the effect of Jigsaw 2 strategy in learning variables other than achievement and motivation such as self-esteem, test anxiety, and classroom interaction.

- Adopting Jigsaw 2 strategy in teaching the Islamic Education due to its effectiveness in enhancing both achievement and motivation.
- Conducting training sessions for the teachers of Islamic Education to be well trained in using Jigsaw 2 strategy.

References

- Abu snina, O. (2008). the effect of two forms of cooperative learning and students' gender on the immediate and delayed achievement of tenth grade students in National and Civic Education in comparison with the traditional method of learning. *Al-Quds Open University Journal for Research and Studies*, 14, 85-111.
- Albaghdadi, M., Abu alhuda,H., Kamal,A.(2005). Cooperative learning. Alfikr Alarabi Publishing and Distribution, Cairo.
- Alhadeed, F. (2004).The Impact of Cooperative learning in Islamic education and its impact on the Achievement of ninth grade students compared to the Conventional Method. Unpublished MA Thesis, University of El Fasher, Sudan.
- AL-Heela, M. (2002). Classroom teaching skills, Almassira Publishing and Distribution, Amman.
- Alsalkhi,M.(2009). Methods of teaching Islamic education. , Alkonouz Publishing and Distribution, Amman.
- Fitzgerald, W.; Bouck, M., (1993).Models of Instruction. In *Research Ideas for the Classroom Middle Mathematics* (edited by Owens, D.)Macmillan Pub. Company.
- GÖMLEKS İZ, M. N.(2007). Effectiveness of cooperative learning (jigsaw II) method in teaching English as a foreign language to engineering students (Case of Firat University, Turkey), *European Journal of Engineering Education* Vol. 32, No. 5, 613–625.
- Kagan, S. (2000). The Structural Approach to Cooperative Learning In *Cooperative Learning: A Response to Linguistic and Cultural Diversity*, Edited by Daniel Holt. Mc Henry Ill, and Washington, D.C: Delta System and center for Applied Linguistics, 9-19.
- KOÇ, Y , DOYMUŞ , K. KARAÇÖP, A , ŞİMŞEK, Ü(2010) The Effects of Two Cooperative Learning Strategies on the Teaching and Learning of the Topics of Chemical Kinetics , *Journal of Turkish Science Education*, Volume 7, Issue 2, 52-65.
- Maden, S. (2011). Effect of Jigsaw I Technique on Achievement in Written Expression Skill, *Educational Sciences: Theory & Practice* - 11(2), 911-917
- Mengduo, Q & Xiaoling, J. (2010). Jigsaw Strategy as a Cooperative Learning Technique: Focusing on the Language Learners. *Chinese Journal of Applied Linguistics*, Vol. 33 No. 4. 113-125.
- Muncie, M, Saleh, A, Qasim, N and Aljundi, A. (2002). Educational psychology and individual differences of the children, The Alexandria Center for the Book. Alexandria.
- Souvignier, E., & Kronenberger, J.(2007). Cooperative learning in third graders' jigsaw groups for mathematics and science with and without questioning training. *British Journal of Educational Psychology*, 77, 755–771.
- Tobin,K., Tippins, D., Gallard, A(1994). Research on instructional strategies for teaching science, *Handbook of research on science teaching and learning*, V.45. 45-93.