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Use of Jigsaw 1 Cooperative Learning Strategy to Enhance Academic Performance of Students of Varying Cognitive Styles

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ABSTRACT: *The aim of this study was to determine the Use of Jigsaw 1 Cooperative Learning Strategy to enhance academic performance of students of varying Cognitive Styles. The research design used for this study was quasi-experimental design of non-equivalent group involving pretest and posttest. The population of this study was 1,677 (1,000 males and 677 females) Upper Basic II students for 2018/2019 academic session. Sample size of 63 (38 males and 25 females) students were randomly selected using a simple random sampling technique. Cognitive Style Test (CST) and Basic Science Academic Performance Test (BSAPT) were the instruments used for data collection. The instrument was adapted and validated by 5 experts. The Pearson-Product Moment Correlation Coefficient was used to determine the reliability coefficient of BSAPT. The reliability coefficients found was 0.81. Four research questions were raised and four null hypotheses were tested. Descriptive statistics of mean and standard deviation were used for answering the research questions. Inferential statistics of t-test independent was the statistical tool used for testing the hypotheses at $p \leq 0.05$ level of significance. The findings among others revealed that: there was a significant difference between the mean academic performance scores of the experimental group and the control group in favour of the experimental group. Also Jigsaw 1 Cooperative Learning Strategy was gender friendly. It was therefore, recommended among others that Jigsaw 1 Cooperative Learning Strategy should be used to teach all students irrespective of cognitive and gender.*

KEYWORDS: jigsaw 1 cooperative learning strategy, basic science, performance, convergent, divergent and gender

INTRODUCTION

Basic science was formerly called Integrated science. It is taught at lower (primary 1-3), middle (primary 4-6) and upper (JSS 1-3) of Basic education levels in Nigeria school setting. Basic science is a science subject that occupies an important position in the school science curriculum in Nigeria. This is because it is the first science subject that is introduced to a learner which serves as a foundation for the subsequent study of science subjects (Physics, Chemistry and Biology) at the senior secondary schools. The importance of Basic science cannot be overemphasized. Based on the importance of Basic science, one would expect that the academic performance of students in Basic science would be high especially in external

examination such as the Basic Education Certificate Examination (BECE). However, the Basic Education Certificate Examination (BECE) has revealed the poor academic performance of students in Basic science.

This poor academic performance is buttressed by Tofi, Adejoh and Ochu (2017) who revealed that students' academic performance in Basic Science has been poor. This poor academic performance of students has been attributed to numerous factors such as; poor class room management, teacher attitude towards the teaching of Basic science, students lack of interest in learning science (Okoyefi & Nzewi, 2015) and also the teaching method employed by teachers. Method of teaching has been found to be one of the major factors responsible for students' poor academic performance in Basic science. Lawal, Bichi and Shuaibu (2017) states that most teachers employ lecture method in the teaching of science. Majority of the teachers use lecture method in teaching science subjects, which is teacher-centered. This is because the method leads to covering a wider area of the curriculum within a short time. However, lecture method does not encourage active participation of students in the teaching and learning process making the learners passive. Therefore, the Federal Government of Nigeria (2013) deemphasized the use of lecture method in the teaching of Basic science and recommended the use of student-centered methods. Hence, teachers were expected to actively engage the students in the learning process through effective methods which are student-centered such as problem solving instructional strategy, concept mapping and Cooperative Learning Strategy.

Cooperative Learning Strategy is defined by Ahmad (2019), as a teaching strategy that involves students learning in small groups with different ability levels in order to comprehend a subject matter. The students' engage in interactions with their peers, teachers and other experts. There are numerous types of Cooperative Learning Strategy namely: Reversed Jigsaw, Subject Jigsaw, Think-Pair-Share, Jigsaw II, III, IV and Jigsaw 1 among others. From the numerous types of Cooperative Learning Strategies, this present study utilized Jigsaw 1 Cooperative Learning Strategy. In Jigsaw 1 Cooperative Learning Strategy Amedu (2015) explains that, students' are members of two different groups, the 'home groups' and the 'expert groups' with 4-6 members, to work on an instructional material that has been broken down into sections. Each student from every 'home group' is assigned a portion of the material. Then the home groups breaks apart, like pieces of the jigsaw puzzle, and each home team sends representatives to join with other representatives from all the other teams and form 'expert groups. While in the expert groups the students' study intensively the particular material assigned to them to ensure that they understand it well and prepare it for peer tutoring. Later, each student returns to his/her respective home group where he/she teaches his assigned material to the rest of his/her group members and learns the other sub-topics assigned to his/her peer in the group. After the completion of the assigned learning tasks over a number of class periods each student takes an individual test. Cooperative Learning Strategy is an innovative method which would enhance academic performance of students of varying cognitive styles.

Cognitive style is defined by Lawal *et al* (2017) as an individual's variation in modes of perceiving, a way of apprehending, storing, transferring and utilizing information. There are different dimension of cognitive styles namely; field dependence and field independence, reflexivity-impulsivity dimension, divergent and convergent. From the various cognitive styles

this present study focused on convergent and divergent cognitive styles because there is paucity of research on convergent and divergent students' academic performance in Basic science. Convergent students are good at making practical applications of ideas and using deductive reasoning to solve problems. Conversely, divergent students are imaginative and good at creating ideas and seeing things from different perspectives. This is very important however, most teachers are not aware of their students' unique cognitive styles. Therefore, they fail in their teaching method to meet each single student's cognitive style. Cognitive style is very important, therefore teachers should pay attention to the cognitive styles of students irrespective of their gender in the teaching and learning process. Hence, studies should be conducted in Basic science on academic performance of cognitive styles and gender.

Gender is described by Mbonu and Okoli (2019) as a socially ascribed attribute which differentiates male from female. Review of studies show inconsistency on the results of male and female students' academic performance in Basic Science and science at large. Alamri (2018) found that female students performed better than the male students. Nwachukwu (2014) and Amedu (2015) revealed that boys perform better than their female counterparts. While Kingdom-Aaron, Etokeren and Okwelle (2019) showed that there is no significant difference between male and female students. Based on the inconsistency on the results of male and female students' academic performance in Basic Science and science at large, it is pertinent to investigate whether the use of Jigsaw 1 Cooperative Learning Strategy would enhance academic performance of students of varying Cognitive Styles.

Objectives of the Study

The objective of this study is to use Jigsaw 1 Cooperative Learning Strategy to enhance academic performance of students' of varying cognitive styles. Specifically the study sought to:

1. determine the effect of Jigsaw 1 Cooperative Learning Strategy on mean academic performance scores of convergent students' taught Basic Science and those taught using Lecture method.
2. determine the effect of Jigsaw 1 Cooperative Learning Strategy on mean academic performance scores of divergent students' taught Basic Science and those taught using Lecture method.
3. find out the effect of Jigsaw 1 Cooperative Learning Strategy on mean academic performance scores of male and female convergent students' taught Basic Science.
4. find out the effect of Jigsaw 1 Cooperative Learning Strategy on mean academic performance scores of male and female divergent students' taught Basic Science.

Research Questions

The following research questions were posed to guide the study:

1. What is the difference between the mean academic performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method?
2. What is the difference between the mean academic performance scores of divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method?

3. What is the difference between the mean academic performance scores of male and female convergent students taught Basic science using Jigsaw 1 Cooperative Learning Strategy?
4. What is the difference between the mean academic performance scores of male and female divergent students taught Basic science using Jigsaw 1 Cooperative Learning Strategy?

Null Hypotheses

The following null hypotheses were formulated based on research questions and were tested at 0.05 level of significance.

Ho_1: There is no significant difference between the mean academic performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method.

Ho_2: There is no significant difference between the mean academic performance scores of divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method.

Ho_3: There is no significant difference between the mean academic performance scores of male and female convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy.

Ho_4: There is no significant difference between the mean academic performance scores of male and female divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy.

Research Design

This study employed a quasi-experimental design of non-equivalent group involving pretest and posttest. Specifically, the study used a non-randomized pretest, posttest control group design. The reason for the adoption of a Quasi-experimental design is that the researcher used intact classes for the study. The population of this study comprised of 1,677 (1000 males and 677 females) Upper Basic II students for 2018/2019 academic session in Makurdi Local Government Area of Benue state (Benue State Ministry of Education, Science and Technology, 2019).

Four schools were randomly selected and used for data collection. A pretest (BSAPT) was given to students in the four sampled schools to determine the equivalence of academic performance of the students among the four sampled schools, the pretest (BSAPT) results of the students were subjected to Analysis of Variance (ANOVA) statistical tool at $p \leq 0.05$ and the result obtained showed that there was no difference. Then a simple random sampling technique involving balloting was used to select two schools. Furthermore, a simple random sampling technique of "Hat and Draw" was used to assign the two schools into the experimental group and control group. The choice of this technique was to give every sampled school an equal chance of been selected. Total number of participants randomly sampled was 63 made up of 38 males and 25 females. The sample size for the study is 63 Upper Basic II students made up of 38 male and 25 female students drawn from two secondary schools in the Local Government Area.

The instruments used for data collection were namely; Cognitive Style Test (CST) and Basic Science Academic Performance Test (BSAPT). Cognitive Style Test (CST) was adapted from Duniya (2016) and validated by four (4) experts, three in the field of science education. It was used to identify the convergent and divergent students. CST contained six (6) common objects. The duration for the CST was 30 minutes. Each correct answer attracted 1 mark and the total marks for each object is 5 marks while the grand total for all the six (6) objects is 30 marks (i.e 5 marks × 6 objects = 30 marks). The scores were used for classification of students' into convergent and divergent thinkers. The rating scale was 1–15 marks for Convergent and 16–30 marks for Divergent.

The Basic Science Academic Performance Test (BSAPT) items were adapted from the Basic Education Certificate Examination past questions (2011-2018) and validated by four (4) experts, three in the field of science education, one in Measurement and Evaluation. The BSAPT comprised of twenty-five (25) multiple choice questions with four options (A, B, C and D), the key and three (3) distractors. This was used to assess students' academic performance in Basic science. The BSAPT items were based on the Upper Basic II syllabus covering the concepts: Work, Energy and Power; Thermal Energy and Crude Oil and Petrochemicals which were taught by the researcher. Each correct answer attracted one (1) mark and each wrong answer was scored zero. The participants were expected to answer the questions within a period of fourty (40) minutes. The BSAPT was administered, as pretest and posttest to both experimental and control groups.

Test-retest method was administered within the period of two weeks to determine the reliability of the BSAPT. The test instrument was administered to 40 Upper Basic II students' made up of 18 males and 22 females in a school that is part of the population but not part of the study. After, two weeks; the same test was re-administered to the same group. One (1) hour thirty (30) minutes was given to the students' in other to enable them answer the questions. Thereafter, the researcher marked the scripts and the data collected from the school (students') was used to determine; the appropriate time required by the subjects to complete the test, access the feasibility of the study before commencement, the reliability coefficient of the instruments and difficulty/facility index of the items in the instruments.

The data from the two administrations were analyzed using Pearson Product Moment Correlation Coefficient (PPMCC). The reliability coefficient of BSAPT was found to be 0.81. BSAPT (pre-BSAPT) was administered to experimental and control groups before the commencement of the experiment. Pretest (pre-BSAPT) was to determine the equivalence of the participants before treatments. After treatment to the experimental group using lesson plans on Jigsaw 1 Cooperative Learning Strategy and after teaching the control group using lesson plan on Lecture method for a period of six weeks, the posttest (post-BSAPT) was administered to both the experimental group and control group. Both the pretest (pre-BSAPT) and posttest (post-BSAPT) were administered and marked by the researcher according to the marking scheme. The research questions were answered using descriptive statistics of mean and standard deviation. The hypotheses formulated were tested at $p \leq 0.05$ level of significance using inferential statistics of independent t-test statistics.

Data Analysis and Result Presentation

Research Question 1: What is the difference between the mean academic performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method?

Table 1: Mean and Standard Deviation of Academic Performance scores of Convergent students' of Experimental and Control Groups

Groups	Cognitive Style	N	Mean	Standard Deviation	Mean Difference
Experimental Group	Convergent Students'	26	16.19	3.71	4.54
Control Group	Convergent Students'	23	11.65	4.09	

The results in Table 1 shows that the convergent students' in experimental group taught Basic Science using Jigsaw 1 Cooperative Learning Strategy had a mean academic performance scores of 16.19 with a standard deviation of 3.71, while those taught Basic Science using Lecture method had a mean academic performance scores of 11.65 with a standard deviation of 4.09. The difference between the mean academic performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture Method is 4.54. This implies that there was a difference between the posttest mean scores of convergent students' of the experimental and control groups, in favour of the convergent students' taught using Jigsaw 1 Cooperative Learning Strategy.

Ho_1: There is no significant difference between the mean academic performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method.

Table 2: Analysis of independent t-test on Academic Performance scores Convergent Students' of Experimental and Control Groups

Groups	N	Mean	SD	Df	t-cal	p-value	Remark
Experimental Group Convergent Students'	26	16.19	3.71	47	4.07	0.00	S
Control Group Convergent Students'	23	11.65	4.09				

Significant at $p \leq 0.05$

Table 2 reveals that calculated t-value was 4.07 and the p-value 0.00. Therefore, p-value of 0.00 was less than significant level of $p \leq 0.05$. Based on this evidence, the null hypothesis was rejected. This shows that there was significant difference between the mean academic

performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture methods in favour of the convergent students' taught using Jigsaw 1 Cooperative Learning Strategy. This implies that Jigsaw 1 Cooperative Learning Strategy enhanced the academic performance convergent students than Lecture method in teaching and learning of Basic Science.

Research Question 2: What is the difference between the mean academic performance scores of divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method?

Table 3: Mean and Standard Deviation of Academic Performance of Divergent students' of Experimental and Control Groups

Groups	Cognitive Style	N	Mean	Standard Deviation	Mean Difference
Experimental Group	Divergent Students'	9	21.11	2.37	9.51
Control Group	Divergent Students'	5	11.60	8.73	

The results in Table 3 shows that the divergent students' in experimental group taught Basic Science using Jigsaw 1 Cooperative Learning Strategy had a mean academic performance scores of 21.11 with a standard deviation of 2.37, while those taught Basic Science using Lecture method had a mean performance scores of 11.60 with a standard deviation of 8.73. Therefore, the difference between the mean performance scores of divergent students' taught Basic Science with Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method is 9.51. This implies that there was a difference in the posttest mean scores of divergent students' of the experimental and control groups, in favour of the divergent students' taught using Jigsaw 1 Cooperative Learning Strategy.

Ho_2: There is no significant difference between the mean academic performance scores of divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture methods.

Table 4: Analysis of independent t-test on Academic Performance among Divergent Students' of Experimental and Control Groups

Groups	N	Mean	SD	Df	t-cal	p-value	Remark
Experimental Group Divergent Students'	9	21.11	2.37	12	3.16	0.01	S
Control Group Divergent Students'	5	11.60	8.73				

Significant at $p \leq 0.05$

Table 4 reveals that calculated t-value was 4.07 and the p-value 0.01. Therefore, p-value of 0.01 was less than significant level of $p \leq 0.05$. Based on this evidence, the null hypothesis was rejected. This shows that there was significant difference between the mean academic performance scores of divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture methods in favour of the divergent students' taught using Jigsaw 1 Cooperative Learning Strategy. This implies that Jigsaw 1 Cooperative Learning Strategy enhanced the academic performance of divergent students than Lecture method in teaching and learning of Basic Science.

Research Question 3: What is the difference between the mean academic performance scores of male and female convergent students taught Basic science using Jigsaw 1 Cooperative Learning Strategy?

Table 5: Mean and Standard Deviation of Academic Performance of male and female Convergent Students' of Experimental Group

Experimental Group	Cognitive Style	N	Mean	Standard Deviation	Mean Difference
Female	Convergent Students'	12	16.42	3.26	0.42
Male	Convergent Students'	14	16.00	4.17	

The results in Table 5 shows that the female convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy had a mean performance scores of 16.42 with a standard deviation of 3.26 while the male convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy had a mean performance scores of 16.00 with a standard deviation of 4.17. Therefore, the difference between the mean academic performance scores of male and female convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy 0.42. Hence, there was a difference in the posttest mean scores of female and male convergent students. This indicates that the female convergent students' performed slightly higher.

Ho_3: There is no significant difference between the mean academic performance scores of male and female convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy.

Table 6: Analysis of independent t-test of Academic Performance of Male and Female Convergent Students' of Experimental Group

Experimental Group	N	Mean	SD	Df	t-cal	p-value	Remark
Female Convergent Students'	12	16.42	3.26				
				24	0.28	0.78	NS
Male Convergent Students'	14	16.00	4.17				

Significant at $p \leq 0.05$

Table 6 reveals that calculated t-value was 0.28 and the p-value 0.78. Therefore, p-value of 0.78 was greater than significant value of $p \leq 0.05$. Based on this evidence, the null hypothesis was retained. This shows that there was no significant difference between the mean academic performance scores of male and female convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy. This implies that Jigsaw 1 Cooperative Learning Strategy was gender friendly on academic performance between male and female convergent students.

Research Question 4: What is the difference between the mean academic performance scores of male and female divergent students taught Basic science using Jigsaw 1 Cooperative Learning Strategy?

Table 7: Mean and Standard Deviation of Academic Performance of male and female Divergent students' of Experimental Group

Experimental Group	Cognitive Style	N	Mean	Standard Deviation	Mean Difference
Female	Divergent Students'	4	22.75	0.50	
					2.95
Male	Divergent Students'	5	19.80	2.49	

The results in Table 7 shows that the female divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy had a mean performance scores of 22.75 with a standard deviation of 0.50 while the male divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy had a mean performance scores of 19.80 with a standard deviation of 2.49. Therefore, the difference between the mean academic performance scores of male and female divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy 2.95. Hence, there was a difference in the posttest mean scores of female and male divergent students. This indicates that the female divergent students' performed slightly higher.

Ho_4: There is no significant difference between the mean academic performance scores of male and female divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy.

Table 8: Analysis of independent t-test of Academic Performance of Male and Female Divergent Students' of Experimental Group

Experimental Group	N	Mean	SD	Df	t-cal	p-value	Remark
Female Divergent Students'	4	22.75	0.05				
				7	2.30	0.06	NS
Male Divergent Students'	5	19.80	2.49				

Significant at $p \leq 0.05$

Table 8 reveals that calculated t-value was 2.30 and the p-value 0.06. Therefore, p-value of 0.06 was greater than significant value of $p \leq 0.05$. Based on this evidence, the null hypothesis was retained. This indicates that there was no significant difference between the mean academic performance scores of male and female divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy. This implies that Jigsaw 1 Cooperative Learning Strategy effectively enhanced the academic performance of divergent students' irrespective of gender.

DISCUSSIONS

The findings shows that there was a significant difference between the mean academic performance scores of convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method in favour of the students' taught using Jigsaw 1 Cooperative Learning Strategy. This implies that Jigsaw 1 Cooperative Learning Strategy enhanced the academic performance of convergent students more than Lecture Method in teaching and learning of Basic Science. This outcome supports Alamri (2018); and Yemi, Azid and Ali (2018) as well as Kindom-Aaron *et al* (2019), who all found that students' taught using Cooperative Learning Strategy tend to perform better than their counterpart in the control group who were taught using lecture method.

The superiority of Jigsaw 1 Cooperative Learning Strategy over lecture method can be due to the fact that it is a strategy that emphasizes specialization on one aspect of a topic by each member of a group. Every group member must specialize on a portion of the topic while in the expert group, teach his portion to his group members, learn the whole lesson in the home group and individually solve some tasks. Thus, each student learns and helps his group members to learn by providing opportunity for dialogue and free debate on a task, which is not obtained in the lecture method.

The findings shows that there was a significant difference between the mean academic performance scores of divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy and those taught using Lecture method in favour of the students' taught using Jigsaw 1 Cooperative Learning Strategy. The result could be due to the Jigsaw 1 Cooperative Learning Strategy employed for the experimental group which was student centered-method. This outcome supports Samuel (2018), Yusuf (2018) and Ahmad (2019) who all found that students' taught using Cooperative Learning Strategy tend to perform better than their counterpart in the control group who were taught using Lecture method.

The divergent students taught Basic science using Jigsaw 1 Cooperative Learning Strategy performed better than those taught using Lecture method because Jigsaw 1 Cooperative Learning Strategy is a strategy that allows each student in the same group makes contribution for the success of the group. As each student depend and rely on one another to achieve the goal. Every student interact with other students' (group members) providing one another with feedback, challenging reasoning and conclusions, and perhaps most importantly, teaching, helping, supporting, applauding and encouraging one another in order to reach the group's goals which is not found in the lecture method.

There was no significant difference between the mean academic performance scores of male and female convergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy. This finding is in credence with Mobark (2014), Yakubu (2016) and Kingdom-Aaron et al (2019) whom results showed no significant difference in academic performance of male and female students' taught using Cooperative Learning Strategy. However, this finding disagrees with Amedu (2015), and Eze and Obiekwe (2017) who revealed that males performed higher from the Jigsaw Cooperative method compared with the female counterparts. On the other hand Alamri (2018) showed that female students' performed more than their male counterparts taught using Jigsaw Cooperative Learning Strategy. The finding showed that both male and female convergent students' taught using Jigsaw 1 Cooperative Learning Strategy performed equally as no significant difference was found in their mean performance scores. This result shows that Jigsaw 1 Cooperative Learning Strategy was gender friendly and the strategy is effective in enhancing both male and female convergent students' academic performance in Basic Science. This suggests that when teachers use the right strategies and activities, female students' would learn equally as their male counterparts.

Furthermore, the finding revealed that there was no significant difference between the mean academic performance scores of male and female divergent students' taught Basic Science using Jigsaw 1 Cooperative Learning Strategy. This finding is in line with the assertions by Timayi *et al* (2015); Jimoh, Idris and Olatunji (2016); and Kingdom-Aaron *et al* (2019) who all revealed no significant difference in academic performance of male and female students' in the experimental group taught using Cooperative Learning Strategy. This finding is contrary to the findings of Nwachukwu (2014) and Isah (2015) who states that males performed higher in Cooperative Learning Strategy than female counterparts. On the other hand, Yaduvanshi and Singh (2018) showed that female students' performed significantly better than the male students' taught using Cooperative Learning Strategy. This finding could be to the equal classroom interactive/participation opportunities provided to the male and female divergent

students' by the use of Jigsaw 1 Cooperative Learning Strategy as a teaching method. This implies that if male and female students' are given equal opportunities in the learning process using innovative method such as Jigsaw 1 Cooperative Learning Strategy, the educational system in terms of gender differences especially science may be addressed.

CONCLUSION/ RECOMMENDATIONS

Jigsaw 1 Cooperative Learning Strategy was found to be an effective method in enhancing academic performance of convergent and divergent students in Basic Science and it is gender friendly. It was recommended that convergent and divergent students irrespective of gender should be taught using Jigsaw 1 Cooperative Learning Strategy by science teachers, as it is efficacious for enhancing academic performance.

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