Evaluation of the Effectiveness of Team Learning Strategy in the Study of Nomenclature of Organic Compounds among NCE Students

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Abstract: The purpose of this study was to evaluate the effectiveness of team learning strategy in the study of nomenclature of organic compounds among NCE I students. Research objectives, research questions and hypothesis were formulated to guide the researcher in the conduct of the research work. The study used a sample of 20 students out of the population of NCE I chemistry students. The twenty students were randomly placed into experimental and control groups. Experimental-control design was adopted for the study. A pre-test administered to the groups established their equivalent ability. The subjects in the experimental group were treated using team learning strategy and control group was treated using individualistic method for a period of four weeks. The instrument used for data collection was chemistry Achievement Test (CAT) to measure the students’ achievement in chemistry. Independent sample t-test was used to test the hypothesis using SPSS package at 0.05 level of significance. From the T-test result, the probability value (P>0.05) was observed which means there is no significant difference in academic performance among NCE I Students who adopted team learning strategy and those who learned individually. Based on the findings of this research it was recommended that Chemistry teachers in colleges of education in Nigeria should not consider using team learning strategy for teaching as a way of enhancing better understanding of the subject.

Keywords: Effectiveness, Team Learning and Academic Performance.

Background to the Study

Education is the process of imparting and acquiring knowledge through teaching and learning, especially at school or similar institution. Education is very important for the success of an individual in life. It provides learners with the requisite knowledge, skills and competencies that prepare them to become self-reliant, and thereby contribute to the changes and growth of their society. The forgoing is enshrined in National Policy on Education (2013), which sees Nigeria’s educational objectives as being geared towards self-realization, better human relations, individual and national efficiency, effective citizenship, national consciousness and national unity as well as social, cultural, economic, political, scientific and technological progress. Indeed educational system brings changes through various reforms, programs and curriculum development. It is globally recognized as the bedrock of individual and national development. Chemistry is the science that systematically studies compositions, properties and activities of organic and inorganic substances and various elementary forms of matter (Nnoloi 2011). It is also an investigation enterprise which plays a key role in the future progress of mankind. According to the Nigerian Educational Research and Development Council (NERDC, 2007), Chemistry is crucial for effective living in the modern age of science and technology. Given its application in industries and in many other professions, the minimum standard embodied in
chemistry education is designed to build confidence in students and enhance their activities to adapt to the changing situation in scientific and technologically oriented society. Some innovative teaching methods have been suggested for effective teaching of chemistry. They include; team learning strategy, constructivist based learning, problem solving and team learning strategies (John, Barchok and Ng’eno 2014).

Poor academic achievement of secondary N.C.E students raises doubts on the efficiency of the teaching methods utilized by lecturers in federal college of education. It has been found that lecturers continue to use lecture method instead of activity oriented strategies at the expense of meaningful learning on the part of the learners.

Priyono and Boed (2017) stated that team learning strategy is a learning approach that teachers should emphasizes to encourage students’ active learning through various activities to develop the three domains of learning (cognitive, affective, and psychomotor). He further explained that learning is a highly complex process. Therefore, an effective learning process cannot be done with a single approach.

Team learning strategy was developed as a teaching approach that encourages and develops students’ active participation in learning theories or concepts through various activities and hands-on experiences in a multitude of learning environments. This research work therefore, was aimed at evaluating the effectiveness of team learning strategy in the study of nomenclature of organic compounds among NCE students.

Statement of the Problem

In educational sector especially in science education, most students are facing a lot of challenges which include lack of proper understanding of subject-matter content. Some teachers are using inappropriate methods of teaching some topics in chemistry; the search for more effective approach to the teaching and learning of science (chemistry) for better performance of students has persisted over the years.

The instructional strategies employed by lecturers are crucial in the implementation of curriculum content. A strategy is a predetermined way and manner used by a lecturer to promote learning among students. The difficulties experienced by some science lecturers in putting their lesson across to learners could not be traceable to the fact that they are not properly informed about current methods and equipment, nor are they equipped with relevant skills of new techniques that showcase best practices. Learners therefore, find the subject content areas irrelevant to their daily experience and survival needs in their socio-cultural and economic environment.

The conventional teaching methods lack students’ involvement, commitment and interaction required for effective learning of some difficult Chemistry concepts.

Having reflected on the issues of poor performance in chemistry among N.C.E students, it is necessary to determine the extent to which students’ exposures to the five stages intrinsic in team learning teaching strategy could be explored in enhancing their mastery of chemistry concepts when compared to the use of teacher-centered methods in teaching the subject-a method which is prevalent in many science schools. It has also become necessary to determine the extent to which the exploration of the team learning teaching strategy could offer a better teaching methodology for enhancing students’ academic performance in the subject area when compared to other conventional methods of teaching the subject.

Objectives of the Study

This study is aimed at achieving the following objectives;

1. To find out the difference in academic performance among N.C.E students who adopt team learning strategy and those who learn individually at federal college of education.
2. To determine the impact of team learning strategy on N.C.E student’s academic performance at federal college of education Katsina.

Research Questions

1. Is there a difference in academic performance between students who adopt team learning strategy and those who do not.
2. What impact does team learning strategy have on student’s academic performance at N.C.E level?

Research Hypotheses

The following null hypotheses are formulated to guide the study; to be tested at (0.05) level of significance. These hypotheses will be used to answer the research questions raised above:

**H₀₁**: There is no significant difference in academic performance among students who adopt team learning strategy and those who learn individually at Federal College of Education Katsina.

**H₀₂**: Team learning strategy has no positive impact on N.C.E student's academic performance.

Significance of the Study

The finding of this study is expected to contribute towards improving chemistry learning and achievement in federal colleges of education. The information will be helpful and beneficial to all stakeholders in education that include government, lecturers, school administrators, students, private organization, researchers and society in general. The information will be helpful to textbooks writers so that they can reflect new strategies in their books which will aid meaningful learning as well as to help the students intellectually.

It will also help in sensitizing the lecturers to pay attention to both the affective and cognitive domain of the learners. The assistance that the students will get from the lecturers will enable them to develop self-confidence and positive attitude toward the learning of chemistry.

Research Design

The design of this research study was Experimental group and Control group. In this regard, the team learning strategy is the independent variable, while students performance is considered as the dependent variables.

Firstly, a pretest was administered to both experimental and control groups; this measured the knowledge of nomenclature of organic compounds and the equivalent ability of both experimental and control groups before the treatment. The experimental group was exposed to treatment, in which they were exposed using team learning strategy while the control group received individualized learning strategy. Post-test was administered at the end of the learning.

Instrument of Data Collection

Chemistry Achievement Test (CAT) was used as instrument for data collection. Organic compound were drawn and students were asked to name them according to IUPAC system.

Procedure for Data Collection

The researcher sought for all necessary permission to execute the research work in the sampled school. After then, with the help of chemistry teacher administered the Chemistry Achievement Test (CAT) to all the groups (experimental and control) as a pre-test before the treatment. After the pre-test, both groups received the treatment. The treatment lasted for four weeks. After the treatment, post-test was administered.

Procedure for Data Analysis

The mean and standard deviations was calculated for these scores after the treatment and was used to answer the research questions and to test the null hypotheses raised in the study. The hypotheses was tested with t-test Analysis (t-test independent sample), at 0.05 alpha levels of
significance. The confirmation or rejection of the hypothesis will be at P< 0.05 level of significant difference.

Data Analysis and Results

Test Scores of Experimental Group and Control Group

<table>
<thead>
<tr>
<th>S/N</th>
<th>CONTROL GROUP (Test Scores)</th>
<th>EXPERIMENTAL GROUP(Test Scores)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pre- test</td>
<td>post- test</td>
</tr>
<tr>
<td>1</td>
<td>00</td>
<td>02</td>
</tr>
<tr>
<td>2</td>
<td>01</td>
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<td>00</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

T-test Analysis of Students Academic Performance between Experimental Group and Control Group.

The data obtained were analysed as follows;

<table>
<thead>
<tr>
<th>T-TEST: Two-sample assuming equal variance</th>
<th>Control Group Score</th>
<th>Experimental Group Score</th>
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</thead>
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<tr>
<td>Mean</td>
<td>1.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Variance</td>
<td>0.6777778</td>
<td>0.9888889</td>
</tr>
<tr>
<td>Observation</td>
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<td>10</td>
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<tr>
<td>Pooled variance</td>
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<tr>
<td>Hypothesize mean difference</td>
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</tr>
<tr>
<td>DF</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>t stat</td>
<td>0.489897949</td>
<td></td>
</tr>
<tr>
<td>P (T&lt;=t) one-tail</td>
<td>0.315061793</td>
<td></td>
</tr>
<tr>
<td>t Critical one-tail</td>
<td>1.734063607</td>
<td></td>
</tr>
<tr>
<td>P(T&lt;=t) two tail</td>
<td>0.630123586</td>
<td></td>
</tr>
<tr>
<td>t Critical two-tail</td>
<td>2.10092204</td>
<td></td>
</tr>
</tbody>
</table>

The output indicates that the mean for Control group 1.3 and for Experimental group 1.1. Looking in the variance row, we can see that they are not exactly equal, but they are close enough to assume equal variance.

For this result, p-value for two tail test will be used P (T<=t), p-value from the table is 0.630123586 Which is greater than the significance level of 0.05 used, therefore we cannot reject the null hypothesis.

Based on the findings from the T-test above, it can be concluded that there is no significant difference in academic performance among students who adopts team learning strategy and those who learn individually at federal college of education Katsina, and team learning strategy had no positive impact on NCE students academic performance.

Answering Research Questions.

1. Is there difference in academic performance among NCE students who adopt team learning strategy and those who learn individually at federal college of education Katsina?
From the T-test result, we have the probability value (P>0.05) which means, there is no significant difference in academic performance among NCE students who adopt team learning strategy and those who learn individually.

2. What impact does team learning strategy have on students academic performance at NCE level?

From the T-test result, team learning strategy has insignificant impact on students academic performance at NCE level, this could be judged by probability value (P>0.05) meaning statistically insignificant.

**Hypothesis Testing**

Hypothesis one: - There is no significant difference in academic performance among students who adopt team learning strategy and those who learn individually at federal college of education Katsina.

From the T-test result the above null hypothesis will be accepted, because the probability value is statistically insignificant i.e. P>0.05.

Hypothesis two: - Team learning strategy has no positive impact on NCE students academic performance.

From the T-test result, the above null hypothesis will be accepted, because the probability value is statistically insignificant i.e. P>0.05, which mean team learning strategy has no positive impact on NCE students academic performance.

**Summary of the findings**

Based on the collected and analysed data, the major findings of the study reveal that the use of team learning strategy has no positive impact on NCE students’ academic performance.

**Discussion of the findings**

The main purpose of this study was to find out the impact of team learning strategy on NCE students’ academic performance at federal college of education Katsina.

The data obtained from the Chemistry Achievement Test (CAT) was used to test the stated hypothesis in chapter one; "There is no significant difference in academic performance among students who adopt team learning strategy and those who learn individually at federal college of education". From the result obtained, experimental group has mean 1.1 and control group with mean 1.3, this shows that students in control group who learn individually perform better than their counterpart in experimental group who adopt team learning strategy. This might be because, some Students do not have interest in team learning, hence do not participate and must of the time teachers do not bother to find out whether every member of the team participate in doing the assigned task as a team.

**Conclusion**

Based on the findings of the study, the following conclusion were drawn, team learning strategy has insignificant impact on NCE Students academic performance at federal college of education Katsina.

The use of team learning shouldn’t be recommended in the Chemistry Curriculum since it is found to have no positive impact in teaching the subject and teachers should therefore not consider the use of team learning strategy in teaching Chemistry as this will not help to address the poor performance of students.

**Recommendations**

Based on the findings and the conclusion drawn in the study the following recommendations were made:
1) Chemistry teachers in colleges of education in Nigeria shouldn't consider using team learning strategy for teaching chemistry as a way of enhancing better understanding of the subject.

2) Team learning shouldn't be emphasized and incorporated into the Chemistry education curriculum in colleges of education. The essence is that not all students learn at the same speed, some may need more time to fully understand the task and process the information they are being taught.

3) Students should be allowed to study individually at their own pace, because of individual differences.

4) Where team learning is applied, teachers should make it a point of duty to find a way of making every member of the team to participate in the learning process.

5) Students should be encouraged to organized tutorial classes, for effective learning.

REFERENCES


