

STUDY ON TEACHING TECHNIQUE TO BALANCE CHEMICAL EQUATION IN CHEMISTRY FOR THE STUDENTS OF CLASS IX

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Abstract

This study aims at assessing the level of class IX students in balancing chemical equation and also identifies the teaching technique to balance chemical equation in chemistry for the class IX students. The sample consisted of 40 IX standard students. Purposive sampling technique was used to draw a sample. Single group pre-test and post-test experimental design was administered for collect data. 't'-test was applied to find out the significance of the study. The findings of the study revealed that there is significant difference between pre-test and post-test scores of class IX students in balancing chemical equation.

Keywords: *Teaching, technique, chemical equation, chemistry*

Introduction

In chemistry, a chemical equation is a written symbolic representation of a chemical reaction. The reactant chemical(s) are given on the left-hand side and the product chemical(s) on the right-hand side. The law of conservation of mass states that no atoms can be created or destroyed in a chemical reaction, so the number of atoms that are present in the reactants has to balance the number of atoms that are present in the products.

The main purpose of this paper is to identify the simple technique to balance the chemical equations that may be useful to high school students and chemist teachers. Any chemical equation, no matter how complicated, can be balanced by inspection. In fact, inspection is often the quickest and easiest way to balance complex equation. It does not require the use of oxidation numbers or the splitting of equations into "half reactions". It can be used to balance all kinds of chemical equations, including ionic equations.

The paper showed that the balancing chemical equations by inspection is not a trial-and-error process, because a systematic procedure for the balancing simple and more complicated chemical equations without oxidation numbers or equations with several unknowns can be suggested. The proposed method is suitable for balancing all the chemical equations, including ionic equations, which have single unique solution.

Review of Previous Study

The review of related literature is a significant part of a research study. This helps the research worker to gather up-to-date information about what has been done in the particular area on which he intends to study.

It provides the opportunity of giving an insight into the methods, measures and various other parameters adopted by others, which would lead to the improvement of the research design significantly. Hence a review of previous studies in the relevant areas of

the present study is attempted here. The present study is an attempt to find out the simple technique to balance chemical equations that may be useful to high school students.

Dr. Kakde Rameshkumar Vishwambharrao Sant Gadage Maharaj Mahavidyalaya, Loha Maharashtra conducted a study on **Balancing Chemical Equations by Using Mathematical Model**. In this paper researcher tried to balance the chemical equations by representing the chemical equation into the mathematical model. Particularly used the Gauss elimination method to solve the mathematical problem. With this method, it is possible to handle any chemical reaction with given reactants and products.

Title of the Study

Study on teaching technique to balance chemical equation in chemistry for the students of class IX.

Need and Significance of the Study

Balancing chemical equations is a basic skill in chemistry. It is very essential to have the knowledge about chemical equation and skill of balancing chemical equation at high school level. Usually most of the students commit mistakes in balancing chemical equation. If the mistakes are not corrected, it will be difficult at higher secondary level science students to achieve in chemistry. This should be strictly avoided. So the investigator wanted to find out the students who are facing difficulty in balancing chemical equation. And teach them to make familiar in balancing chemical equation. That is why the investigator has chosen this problem.

Delimitations of the Study

1. The current study is undertaken only at Thiagarajar Model Higher Secondary School in Madurai district.
2. The investigation is restricted to high school students.

Objectives of the Study

1. To identify the problems faced by students of standard IX in balancing chemical equation.
2. To execute the appropriate teaching strategy to solve the problems on experimental design.
3. To analyse the learning outcome of the students after the execution.

Hypothesis

- There is significant difference between pre-test and post-test students of IX standard in balancing chemical equation.

Research Design

The investigator has adopted the single group pre-test and post-test experimental method for the present study.

Population

The population of the study was students of IX standard studying in Higher Secondary School, Madurai.

Sample

A sample of 40 students of IX standard from a higher secondary School, Madurai was taken for the present study.

Sampling technique

Purposive random sampling technique was used by the Investigator. Kombo and Tromp (2006) defined the purposive sampling techniques as the sampling technique where the researcher purposively targets a group of people reliable for the study.

Instrumentation

The present study requires Pre-test and Post-test to evaluate the students' mastery of balancing chemical equation. These tests were structured based on the different types of learners; the investigator has prepared a tool in the form of chemical equation which consisted of simple, medium and complex types of chemical equation.

At the beginning, the investigator selected 40 students of IX standard and administered pre-test to evaluate the students' mastery of balancing chemical equation. Result from this test, the investigator identified the total of 15 students who faced the problems in balancing chemical equation. The investigator adopted the single group design for treatment. Then the teaching technique employed for the single group for one week period of time by the investigator. Then post-test was conducted by the investigator to evaluate the students' mastery of balancing chemical equation. The collected data were analysed.

Data Analysis

Appropriate statistical techniques like mean, standard deviation, percentage analysis and 't' test were used to analyze the data.

Table 1: The level of percentage analysis of pre-test

Low	%	Medium	%	High	%
2	13.33	10	66.67	3	20.00

The above table reveals that 13.33%, 66.67% and 20% of students have low, moderate and high level of pre-test scores respectively with respect to balancing chemical equation of standard IX students.

Table 2: The level of percentage analysis of post-test

Low	%	Medium	%	High	%
2	13.33	8	53.34	5	33.33

The above table reveals that 13.33%, 53.34% and 33.33% of students have low, moderate and high level of post-test scores respectively with respect to balancing chemical equation.

Hypotheses Testing

Null hypothesis

There is no significant difference between pre-test and post-test scores of IX Standard students in balancing chemical equation.

Table 3: Difference in pre-test and post-test scores of IX standard students in balancing chemical equation

Group	N	Mean	SD	Calculated 't' value	Table value	Remarks (at 5% level)
Pre-test	15	24.44	12.51	6.79	2.52	Significant
Post-test	15	70.67	15.08			

It is inferred from the above table that the calculated 't' value (6.79) is greater than the table value (2.52) at 5% level of significance. Hence the null hypothesis is rejected. That is, there is significant difference between pre-test (24.44) and post-test (70.67) scores of IX Standard students in balancing chemical equation. This may be due to the reason that the teaching technique influences the student's achievement.

Findings

On the basis of the study, the following findings were obtained.

- 13.33%, 66.67% and 20% of students have low, moderate and high level of pre-test scores respectively with respect to balancing chemical equation.
- 13.33%, 53.34% and 33.33% of students have low, moderate and high level of post-test scores respectively with respect to balancing chemical equation.
- There is significant difference between pre-test (m=24.44) and post-test (m=70.67) scores of Standard IX students in balancing chemical equation.

Suggestions

- To make the students to understand in balancing chemical equation by using the simple inspection method.
- The staff should handle the weak students individually.

- Necessary steps are to be taken to improve the weak students.
- The staff may often conduct the class test to follow the students understanding.

Recommendations

- This study may be conducted in higher secondary level also.
- Problem solving skill may be analysed in higher secondary school students in science subjects.

Conclusion

After adopted the Inspection method to balance the chemical equation for the weak students, they found to be feel good to balance the chemical equation. They have got good scores in the achievement test.

References

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