



## 'BALANCING OF CHEMICAL EQUATION' INTERESTING IN SCIENCE SUBJECT FOR STD. VIII

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### 1.0 INTRODUCTION

At secondary level, content of the Science subject is divided in to three main branches Physics, Chemistry and Biology. The main educational objectives of science is to develop scientific vision, curiosity, observation power, logic power etc. in the students. Yet, there are certain topic, concept or events of science which can be difficult to understand and complicated for the students. From researcher's self experience, discussion with science teachers and interview with the students, he found that one of the difficult topic of science is 'Balancing of Chemical Equation". Some words of topic such as element, compound, their symbol and atomic formula, balancing equations etc. are becomes very difficult for the students. It is more important that students get proper understanding of each words than to cram only. Therefore, the researcher has thought about to undertake this topic for research. In this research, researcher has tried to find out the reasons of students uninterest and attempted to make the topic interesting by solving reasons.

### 2.0 STATEMENT OF THE PRESENT STUDY

The statement has been entitled as, "Students of Std.-VIII are not interested in balancing the chemical equation in science subject".

#### **2.1 Objectives of the present study**

The present research has following objectives :

- (1) To find out the causes of apathetic behaviour of the students towards the topic 'balancing the chemical equation'.
- (2) To suggest the solutions of how to make interesting the topic 'balancing the chemical equation' in students.

## **2.2 Alternative hypothesis of the present study**

The following null hypothesis was formulated by the researcher :

There is significant difference in the mean educational achievement between the situation before and after execution of research action plan in the topic balancing the chemical equation in the students.

## **2.3 Tools of the study**

In the present study following tools and techniques were used by the investigator :

- (1) *Opinionnaire* - Researcher has prepared an opinionnaire with the help of experts and experienced science teachers. The opinionnaire is 15 questions of multiple and free answer type question in it.
- (2) *Teacher made achievement test* - The researcher has prepared two test (pre and post), following the suggestions of experts. Each test consist of 25 marks.
- (3) Observation and Interview.

## **2.4 Collection of Date**

With the help of above tools and techniques the investigator collected the following information :

By the use of opinionnaire, researcher has collected the information about the different methods, techniques, educational equipment, exercise by which the teacher had taught this topic. By using the pre test, researcher has collected the information that students had poor pre knowledge and poor in balancing chemical equation, and another test is used for measuring the educational achievement of students after the execution of action plan.

Researcher has compiled the causes which are students error in the present topic, prohibited matters for learning, noted disagreeable causes of present topic by observation and interview.

## **2.5 Probable cause of the present study**

The researcher has found out the following probable causes :

- (1) The present topic was taught by lecture method only.
- (2) The present topic was taught by the method of text book reading, therefore students were not interested towards this point.
- (3) For the explanation of the fundamental matters of the chemical equation, the black board is necessary yet teacher did not use it.
- (4) The teacher explained the present topic without educational equipments.
- (5) Students had not available an individual opportunity for the process of the balancing of chemical equation.
- (6) Proper home work was not given to the students for better practice.
- (7) Science teacher was apathetic towards the present topic
- (8) Pre-knowledge of the present topic was very poor of the students.
- (9) Students mathematical efficiency was very poor.
- (10) Students was repeatedly irregular.

## 2.6 Experimental Action Plan

There are three points related with this step.

- (1) Situation before the execution of action plan.
- (2) Execution of action plan.
- (3) Situation after the execution of action plan.

### 2.6.1 Situation before the execution of action plan

Researcher was found the following characteristics :

- (1) Student's were devoid of zeal and dispirited to know and to identify the fundamental matters of chemical equation.
- (2) Most of the students did not know that an equation is said to be balanced if the number of atoms of one or more elements in reactants and products are equal.
- (3) Students were not interested in exercise and home work given in the class room.

### 2.6.2 Execution of Action Plan

The study involves the following steps to execute the action plan as given in the table-1.

**TABLE - 1**  
**EXPERIMENTAL ACTION PLAN OF MAKING THE**  
**PRESENT TOPIC INTERESTING.**

<b>Sr. No.</b>	<b>Stages</b>	<b>Teaching Points</b>	<b>Way of Teaching (Teacher's activity)</b>	<b>Tools used</b>
1.	Clarification of fundamental matters	* The following fundamental matter of chemical reaction has been clarified to the students. (1) Elements, (2) Compounds, (3) Products, (4) Reactants. * Definitions, symbols, atomic formulas, well known illustrations.	* Teaching of theoretical matter in classroom with use of Mandeleef's periodic table. * Introduction of symbol and atomic formula of elements and compounds on chart at proper time. * Proper use of black board to clarify the number of atoms in compound.	Mendeleef's periodic table. Self constructed charts of (1) Well known elements (2) Well known compounds. Black Board
2.	Balancing of chemical equation	* Explanation of the topics - (1) Translation of chemical reaction's statement in to chemical equation.	* Teaching of translating the statement of chemical relations in to chemical equation by chart. * Explanation of how	Self constructed charts of 1. Metal elements. 2. Non metal elements. Black Board

		(2) The balancing of chemical equation to the students.	to count the no. of atoms on both sides of arrow with the use of flannel board. * Provide the knowledge of balancing the number of atoms of one or more elements in chemical equation with the use of flannel board.	Flannel Board Text book of Std. VII and VIII
3.	Exercise	* Provide more and more training to balance chemical equation to the students.	* Provide the exercise of balancing chemical equation with the use of O.H.P.	Black Board Flannel Board Over head projector. * Exercise book Practical book

### 2.6.3 Situation after the execution of action plan

- (1) Proper use of charts and black board at proper time created interest and understanding of the students in present topic.
- (2) The effective use of educational equipment like charts, flannel board, O.H.P. etc for making the number of atoms equal on both side of equation awakened the students.
- (3) Different examples of balancing chemical equation as an exercise increased enthusiasm of the students.

### 2.7 Analysis of Data

To test the effectiveness of execution of action plan, the researcher has evaluated by the use of teacher made achievement test. The data compiled in tabular form for each situation and analysed to see the mean scores and standard deviation. This is done by placing the data in frequency table. Data are further analysed on the basis of t-value to find out the significance difference which is given in the table-2.

**TABLE - 2**  
**ANALYSIS OF OBTAIN SCORES OF THE STUDENTS IN ACHIEVEMENT TEST**

<i>Sr. No.</i>	<i>Situation</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Total No. of Students</i>	<i>t - value</i>
1.	Before the execution of action plan	8.58	10.41	26	3.79*
2.	After the execution of action plan.	19.54	10.45	26	

\*Shows significant difference at 0.01 level.

According to table-2 we can interpret that, t- value is 3.79 of the students which is significant at 0.01 level. This result indicates that there is significant difference between both the situation. Therefore, an alternative hypothesis is accepted. The mean of the educational achievement of the students after execution of action plan is comparatively higher, so we can say that if the teacher will follow this action plan educational achievement of the students goes higher. Resultant the difference shows the success of action plan.

## **2.8 Results**

The researcher has found out the result after the executing of action plan.

- (1) Students have clear understanding about the fundamental matter of chemical equation and have clear identification of the symbols of elements / atomic formula of compounds.
- (2) Students have got the knowledge about how to count the no. of atoms on both sides of arrow and able to do the entire equation in balanced form.
- (3) Students are very enthusiastic in the process of balancing chemical equations.

## **2.9 Summary**

From the base of the result of the present problem we can summarize that if teacher will give the clear explanation of fundamental matter of chemical reaction, proper use of educational equipments during the teaching, provide proper individual guidance, give proper practice and home work, the students can learn how to balance chemical equation easily and the present topic becomes interesting for the students.

## **2.10 Follow-up work**

The teacher can undertake the follow up work after seeing the results of research :

- (1) The teacher can allot extra time for the students who have very poor knowledge about the topic.
- (2) The teacher can make efforts for the students who are poor in mathematical efficiency.
- (3) The teacher will contact the parents of repeatedly irregular students and provide them proper guidance.

## **3.0 IMPORTANCE OF THE STUDY**

Importance of the present study as under :

- (1) Teachers of the other schools can easily use this experimental action plan because it is easy to execute in teaching process.
- (2) The action plan is directive for the teachers to decides better methods of teaching in the classroom.
- (3) The research work will help to solve the other problems of school and classroom. It can be a base for other teachers and new researcher.

## **4.0 LIMITATIONS OF THE STUDY**

The present research is only related with Std. VIII of Shri Ranchhod Vidyalaya - Rajkot. Therefore, the obtain result is not concerned with the whole universe.

## 5.0 CONCLUSION

The teacher may prepare an action plan of other topics of the curriculum to under take an action research and may lead the quality of education at higher level.

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