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RESEARCH ARTICLE

Effectiveness of the Enrichment Activity in Naming and Writing Chemical Formulas Among Grade 10 Students of Bilaran National High School

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ABSTRACT

This study aimed to assess the effectiveness of the enrichment activity in naming and writing chemical formulas among Grade 10 students of Bilaran National High School. Chemical compound names and formulas can be very complex. This competency is a pre-requisite topic to comprehend chemical reactions. Students experience difficulty in dealing with balancing equation without this knowledge. The researcher used the descriptive and the quasi-experimental method of research. A 50-item adapted examination for pre-test and post-test were utilized to determine the effectiveness of enrichment activity. Descriptive evaluation of the Chemistry Name Game Card was employed to identify how the activity impart knowledge to the students through a questionnaire. The outcome reveals that there is an increase and improvement in the mastery of the topic using the enrichment activity. The respondents strongly agree about the effectiveness of the enrichment activity in terms of its goal and objective, components and organization, playability and playfulness and usefulness. An action plan was proposed for the continuous improvement in the academic performance of students in naming and writing chemical formulas prior discussing chemical reaction.

INTRODUCTION

Chemistry is one of the major branches of Science. Laureano, *et. al.* (2015) stated that a weak Chemistry base at the secondary school level will result in low future achievement in this subject. The knowledge of Chemistry is helpful in solving daily life problems. A poor foundation in Chemistry will jeopardize any future effort to enhance achievement in the subject. The study of Chemistry helps students to develop basic skills, knowledge and competence required for problem solving in their environment.

According to Ohodo (2008), Chemistry contributes to the attainment of the aims of education and specifically helps individuals to develop effective process skills, critical thinking and competences required for dealing with observation, classification, measurement, counting numbers, recording, communication, prediction, hypothesis, inference, experimentation, interpretation of data, research, controlling variable and generalization, etc.

Chemical compound names and formulas can be very complex. Naming conventions vary by chemical compound type and involve Greek prefixes and knowledge of how chemicals react to one another. In writing the formula of a compound, the symbol of the ion with positive oxidation number is written first followed by the symbol of the ion with negative oxidation number. In naming compounds, it is important to identify the compounds. Compounds could be ionic or covalent, binary or ternary. There are different methods of naming compounds. Acids are uniquely named.

Ekere (2014) explained that writing and balancing of chemical equation is a fundamental topic, that without mastery of it, students find every other aspect of Chemistry difficult.

Poor foundation in the teaching and learning of writing and balancing of chemical equation makes the learning of Chemistry ineffective. When student cannot write and balance chemical equations correctly, they cannot communicate effectively within the Chemistry community. Hence, they will not be able to find the application of the subject to their daily lives. The medium of expression in Chemistry is the chemical equation because formulae show Chemistry at a stand while equation shows Chemistry in action.

According to Khurshid, *et. al* (2017) symbols and valences are essential for writing formulas, which in turn are used to write chemical formulas. He explained further that if the students have not grasped the concept of writing formulas and equation then further learning of Chemistry becomes difficult. He also emphasized the importance of learning all the concepts of symbols, valences, formulas and balancing of chemical equations step by step in a logical sequence. Furthermore, he added that writing and balancing of chemical equations play important roles in diverse areas of Chemistry such as stoichiometry, chemical arithmetic, Faraday's laws of electrolysis and volumetric analysis.

Yitbarek (2011) refers to chemical equation as a language of the Chemistry. Once these are introduced, it is assumed that the students will be able to understand these. But many difficulties lie in understanding and learning chemical equations.

The researcher observed that the students experienced difficulty in dealing with balancing equation without prior knowledge of writing and naming chemical formulas. It is in this light that this research was conducted to address this issue.

STATEMENT OF THE PROBLEM

This study aimed to assess the effectiveness of the enrichment activity in writing and naming chemical formulas among Grade 10 students of Bilaran National High School. Furthermore, this sought to answer the following:

1. What is the level of performance of the respondents in writing and naming chemical formulas in the pre-test?
2. What is the level of performance of the respondents in writing and naming chemical formulas in the Post-test?
3. How significant is the difference between the pretest and posttest results of the respondents?
4. How do the respondents assess the enrichment activity in terms of the following:
 - 4.1 goals and objective;
 - 4.2 components and organization;
 - 4.3 playability and playfulness;
 - 4.4 usefulness.
5. What action plan could be proposed to improve students' skill on writing and naming chemical formulas?

HYPOTHESIS

The hypothesis was treated at $p < 0.05$ level of significance in this study. There is no significant difference between the pretest and posttest results of the respondent.

METHODOLOGY

Research Design

The researcher used the descriptive and the quasi-experimental method of research to determine the effectiveness of enrichment activity on writing and naming Chemical formulas.

Respondents of the Study

The respondents of the study were forty-seven (47) Grade 10 students, 17 boys and 30 girls. Thirty (30) students came from Grade 10 – Narra (The A section). The seventeen (17) students were representative of the other 6 sections of Grade 10, drawn voluntarily and preferably, students who will take up Science Technology Engineering and Mathematics (STEM) track in their Senior High school.

FINDINGS

Based on the data presented and analyzed, these are the summary of findings:

Level of Performance of the Respondents in Naming and Writing Chemical Formulas in the Pre-test

The mean average score, mean percentile score (MPS) and proficiency level of the pre-test were 22.72, 45.45% and 72.72, respectively.

Level of Performance of the Respondents in Naming and Writing Chemical Formulas in the Post test

The mean average score, mean percentile score (MPS) and proficiency level of the posttest were 45.23, 90.47% and 95.23, consecutively.

T-test Results of the Difference between the Pre-test and Posttest in Naming and Writing Chemical Formulas

The mean in the post test was higher than that in the pre- test. This signified that there was an increase in the mean of the scores of the learners when the teacher utilized the enrichment activity. The results were supported by the t-test which showed the computed t-value of 33.821 that was higher than the tabular value of 2.01. This means that there was significant difference between the pre-test and post test results in naming and writing chemical formulas. This further rejected the null hypothesis at $p < 0.05$ level of significance.

Assessment of the Respondents on the Utilization of Enrichment Activity in Naming and Writing Chemical Formulas

a. Goal and Objective

As revealed in the data, the respondents strongly agreed that the purpose and rationale for the game are fully explained with 4.93 mean value and got the first rank while the game was thought provoking with 4.77 weighted mean and ranked last. Therefore, Grade 10 students strongly agreed that the enrichment activity met their standard in terms of its goal and objective with a grand mean value of 4.84.

b. Components and Organization

Based on the obtained results, the respondents thought that the directions were clear, concise and easily understood with 4.86 mean values and got the first rank. Meanwhile, they strongly agreed that the terms used were appropriate to the level of their knowledge alongside of 4.58 weighted mean, ranked last. Over-all results showed that the respondents strongly agreed with the components and organization of Chemistry Name card with grand mean values of 4.72. The enrichment activity was particularly clear, concise and easily understood.

c. Playability and Playfulness

As shown in the data, the respondents strongly agreed that playing the game was fun with a perfect weighted mean of 5.0. On the other hand, the rules of the game provide a set of options for flexibility in making decision in playing the game ranked last with mean of 4.67. With a grand mean value of 4.84, Grade 10 learners strongly agreed of the enrichment activity's playability and playfulness.

d. Usefulness

Based on the acquired results, respondents believed that the game was effective in reviewing chemical symbols and names with weighted mean of 4.98 and got the first rank. While mean values of 4.67, they would recommend the game to their peers, and ranked last. With a grand mean value of 4.83, learners strongly agreed about the usefulness of the enrichment activity in terms of being effective in reviewing chemical symbols, names and subject matter. The respondents believed that it is productive to play the game, establishing the knowledge in cations and anions. Moreover, Grade 10 learners approved that the activity can be recommended to their fellow students.

Action Plan to Improve Learners' Skill in Naming and Writing Chemical Formulas

The continuous implementation of enrichment activity, "Chemistry name game card" to Grade 10 students every fourth quarter of the school year prior discussing Module 2, Chemical Reaction is suggested. Monitoring and evaluation is also a must for the improvement of academic performance among students as far as naming and writing is concerned.

CONCLUSIONS

Based on the findings of this study, the researcher arrived at the following conclusions:

1. The MPS result of the pre-test of Grade 10 students, there was no mastery on naming and writing chemical formulas.
2. The MPS result of the posttest using the enrichment activity implied that students gain mastery on naming and writing chemical formulas.
3. There was a significant difference between pre-test and post test results.
4. The respondents strongly agreed that the enrichment activity is effective in terms of goals and objectives, components and organization, usefulness and playability / playfulness.
5. The proponent suggested to utilize this enrichment activity to all Grade 10 as additional activity, to enhance their understanding dealing with naming and writing chemical formulas prior discussing chemical reactions.

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