



# THE STUDY OF CONCEPTUAL CHANGE OF THE 10TH GRADE STUDENTS IN LEARNING THE PROPERTIES OF ELEMENT AND COMPOUND AFTER APPLYING THE TEACHING TECHNIQUES BASED ON HEWSON & HEWSON CONCEPTUAL CHANGE STRATEGIES (2003)

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## INTRODUCTION

According to the researcher's experience in teaching Chemistry, it was found that the students had ambiguous conceptual understanding on the content of Atom and the table of Elements. Thus, they were unable to link to the significant content in terms of the properties of elements and their compound that would lead to the knowledge of elements and compound under the group of IA, IIA, VIIA, metalloids, transition metal, radioactive element as well as the properties and the change of status of substance. Also, the students unfortunately could not explain the properties of Oxide and Chloride of metal and non-metallic elements since they did not understand the knowledge of chemical bonding. Moreover, they could not express the reaction of IA, IIA, VIIA, metalloids, transition metal and radioactive element because they had unclear conceptual understanding in science in terms of the nuclear reaction. As such, they could neither find the half-life of elements nor correctly place the position of elements and their properties in the table of elements. The se have resulted in the low performance of students. Thus, in order to enable students' understanding in science in terms of the properties of elements and compound specified in the subject number V30221, the researcher applied Hewson & Hewson Conceptual Change Strategies (2003) together with other teaching techniques for the 10th grade students of Muncha Suksa School and compared the difference of pre and post experimental outcomes.

## OBJECTIVES

The research objective was to compare the students' scientific conceptual understanding before and after applying pedagogical techniques of Hewson & Hewson Conceptual Change Strategies (2003). The subject of the study is to teach the Properties of Elements and Compound. The study target is the 10th Grade students in Mancha Suksa School.

## RESEARCH METHOD

The target group consists of all Grade 10/1 students from Muncha Suksa School in Muncha Khiri District, Khon Kaen Province. The research was conducted during the 1st semester of the academic year 2017. The research method includes the Pre and Post Test designs. The research experimental tools include 12 lesson plans. Each of the lesson plans requires 18 hours of teaching sessions. The research tool also involves gathering data collection through the use of questionnaires and test comprising of 30 questions integrating relevant scientific concept. The test had a difficulty level of 0.25-0.65, a discrimination power of 0.28-0.85 and a reliability of 0.87.

### References

- Hewson, P.W. (1985). "Diagnosis and Remediation of an Alternative Conception of Velocity Using a Microcomputer Program." American Journal of Physics, 53 (7), 684 – 690.
- Hewson, P.W. & Hewson, M.G.A.B. (1992). The status of students, conceptions. In R. Duit, F. Goldberg & H. Niedderer(Eds.), Research in Physics Learning: Theoretical Issues and Empirical Studies. Germany: In stitute for Science Education at the University of Kiel.
- Hewson, Mariana G. and Hewson, Peter W. (2003). Effect of Instruction Using Students' Prior Knowledge and Conceptual Change Strategies on Science Learning. Journal of Research Teaching, 25(8), 35 – 43.

## ANALYTICAL METHOD

The students group were provided a test to assess their conceptual understanding before and after the class. The pre and post tests were measured to analyze the change of the students' conceptual understanding in science.

## RESEARCH PICTURES



## RESEARCH OUTCOME

According to the pretest and posttest evaluating the students' scientific conceptual understanding in 16 major areas, it was found that the teaching based on Hewson & Hewson Conceptual Change Strategies (2003) resulted in the change of students' understanding in scientific concepts to be better and less ambiguous.

## CONCLUSION AND DISCUSSION

From the total of 40 students, 36 students or 90% changed their scientific concepts whereas 4 students or 10% did not modify their thoughts.