

The integration of 5E inquiry-based learning and group investigation model: Its effects on level four science process skills of form four students

ABSTRACT

Studies found that the mastery of Level-4 Science Process Skills (L4SPS) among secondary school students is still relatively weak. Thus, the purpose of this research was to determine the effects of 5E Inquiry-based Learning and Group Investigation (I5E-GI) model on the five constructs of L4SPS, namely Identifying Manipulated, Responding, and Constant Variables, Forming Hypotheses, Making Observations, Making Inferences, and Defining Operationally. A teaching and learning (TL) module was developed to guide teachers in implementing the I5E-GI method for the five L4SPS constructs. The L4SPS Test Instrument was constructed to measure the level of L4SPS mastery at the end of intervention. The quasi-experimental research design was conducted on 180 Form Four students taking Core Science subjects. A total of three groups were assigned, namely i) 5E Inquiry-based Learning and Group Investigation method (I5E-GI, n = 60), ii) 5E Inquiry-based Learning method (5E, n= 60), and iii) Traditional Learning (TR, n = 60) in an urban secondary school in Sarawak, Malaysia. Data were analyzed using the inferential statistical tests of MANOVA, MANCOVA, ANCOVA, and effect size. The results showed that there was a statistically significant effect across the three groups of TL methods. There is a statistically significant effect of the I5E-GI method compared to the 5E and TR methods on the five L4SPS constructs. As for the effect size, the I5E-GI method provides a more significant effect size than the 5E and TR learning methods. Overall, the findings prove that the I5E-GI method has positive implications for the mastery of L4SPS among Form Four students.