

## **Developing an integrated Project-Based Learning and STEM Learning Module for fostering Scientific Creativity among Fifth Grader**

### **ABSTRACT**

The transformation in science education warrants integration of project-based learning and Science, Technology, Engineering, Mathematics (STEM) for promoting creativity among students. This study aimed to determine the validity and reliability of an integrated project-based learning and STEM teaching and learning module (Pro-STEM) and evaluate its effects on scientific creativity of Fifth Graders. The module consisted of six lessons and six project activities regarding Life Science, Physical Science and Material Science. Evaluation was conducted to determine the reliability, content validity, and students' perception on the learning module, which involved seven subject matter experts and 30 fifth graders. Data were captured through students' responses to two five-point Likert scale questionnaires, open ended questions and self-developed scientific creativity test. Finally, a single group pre- and post-test research design was employed to determine the effects of the Pro-STEM module. A total of 30 fifth graders from one primary school were randomly assigned to Pro-STEM group. The results of module evaluation indicated a good content validity and an acceptable reliability with alpha Cronbach's value of 0.65 to 0.87. Majority of the students were of moderately high positive perception ( $m=4.37$ ) that the activities in the Pro-STEM module enable them to a) generate many ideas, b) generate unique ideas, c) expand ideas, d) think of a special topic, and e) use information from multiple sources to complement sketches. The positive written responses of students indicated the appropriateness of the module. The results of Paired Sample T-test established the effects of the Pro-STEM module in all trait dimensions of scientific creativity. These findings show that Pro-STEM module would represent a reliable and valid learning module for fostering scientific creativity of fifth graders.