The scientific creativity of fifth graders in a stem project-based cooperative learning approach

ABSTRACT

This research aimed to examine the effects of an integrated STEM project-based with cooperative learning (STEM-PjBCL) approach on fifth graders' five sub-scales of trait dimension in scientific creativity. A guasiexperimental pre-test and post-test non-equivalent control group design was employed. A total of 360 fifth graders from four randomly selected primary schools were chosen as sample and assigned to STEMPjBCL (n=120), PjBL (n=120), and Conventional (CV) (n=120) instructional methods. The Figural Scientific Creativity Test was used as the pretest and post-test. Multivariate Analysis of Covariance (MANCOVA) was performed on the posttest scores with pre-test scores as the covariates to examine whether a significant difference existed across the three methods. The results showed that fifth graders taught with the STEM-PjBCL method significantly outperformed their counterparts in the PjBL and CV method in Fluency, Originality, Elaboration, Abstractness of title, and Resistance to premature closure. However, fifth graders taught in the PjBL method did not significantly outperform their counterparts in the CV method in the five sub-scales of scientific creativity. Large effect sizes were obtained for comparing STEM-PjBCL with the PjBL and CV method. The results suggest that the STEM-PjBCL method produces a significant beneficial effect on promoting the five subscales of trait dimension of scientific creativity among fifth graders.