

Comparisons between Student Learning Achievements and Their Problem Solving Skills on Stoichiometry Issue with the Think-Pair-Share Model and Stem Education Method

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Abstract : The aim of this study is to investigate of the comparing the instructional design models between the Think-Pair-Share and Conventional Learning (5E Inquiry Model) Processes to enhance students' learning achievements and their problem solving skills on stoichiometry issue for concerning the 2-instructional method with a sample consisted of 80 students in 2 classes at the 11th grade level in Chaturaphak Phiman Ratchadaphisek School. Students' different learning outcomes in chemistry classes with the cluster random sampling technique were used. Instructional Methods designed with the 40-experiment student group by Think-Pair-Share process and the 40-controlling student group by the conventional learning (5E Inquiry Model) method. These learning different groups were obtained using the 5 instruments; the 5-lesson instructional plans of Think-Pair-Share and STEM Education Method, students' learning achievements and their problem solving skills were assessed with the pretest and posttest techniques, students' outcomes of their instructional the Think-Pair-Share (TPSM) and the STEM Education Methods were compared. Statistically significant was differences with the paired t-test and F-test between posttest and pretest technique of the whole students in chemistry classes were found, significantly. Associations between student learning outcomes in chemistry and two methods of their learning to students' learning achievements and their problem solving skills also were found. The use of two methods for this study is revealed that the students perceive their learning achievements to their problem solving skills to be differently learning achievements in different groups are guiding practical improvements in chemistry classrooms to assist teacher in implementing effective approaches for improving instructional methods. Students' learning achievements of mean average scores to their controlling group with the Think-Pair-Share Model (TPSM) are lower than experimental student group for the STEM education method, evidence significantly. The E1/E2 process were revealed evidence of 82.56/80.44, and 83.02/81.65 which results based on criteria are higher than of 80/80 standard level with the IOC, consequently. The predictive efficiency (R^2) values indicate that 61% and 67% and indicate that 63% and 67% of the variances in chemistry classes to their learning achievements on posttest in chemistry classes of the variances in students' problem solving skills to their learning achievements to their chemistry classrooms on Stoichiometry issue with the posttest were attributable to their different learning outcomes for the TPSM and STEM instructional methods.

Keywords : comparisons, students' learning achievements, think-pare-share model (TPSM), stem education, problem solving skills, chemistry classes, stoichiometry issue

Conference Title : ICERI 2016 : International Conference on Education, Research and Innovation

Conference Location : Kuala Lumpur, Malaysia

Conference Dates : August 18-19, 2016