

Assessing thinking skills: a case of problem-based learning in learning of algebra among Malaysian form four students

ABSTRACT

The teaching and learning of mathematics is a complex and dynamic process involving interaction between previously acquired levels of understanding and conceptualization of mathematical knowledge which consists of mathematical concepts and skills of problem solving in a student centered learning environment. The objective of the study was to examine the effectiveness of PBL in teaching algebra among Form Four students. PBL is a teaching strategy which simultaneously develops higher-order thinking (HOT), disciplinary knowledge bases and practical skills by placing students in an active role as problem solvers confronted with ill-structured problems that mirror real-world problems. The results suggest that the experimental group following the PBL approach performed significantly better than the control group following the traditional approach in the overall performance in algebra, lower-order thinking questions and also higher-order thinking questions. Therefore, PBL is a powerful tool in teaching abstract and intricate concepts of mathematics like algebra.

Keyword: Problem-based learning; Higher order thinking skills; Lower order thinking skills; Mathematics learning; Algebraic thinking