

Liu, M., Hsieh, P., Cho, Y. J. & Schallert, D. L. (2006). Middle school students' self-efficacy, attitudes, and achievement in a computer-enhanced problem-based learning environment. *Journal of Interactive Learning Research*. 17(3). 225-242.

Abstract

This study examined the effect of a computer-enhanced problem-based learning (PBL) environment on middle school students' learning, investigating the relationship among students' self-efficacy, attitude toward science, and achievement. As Bandura defined it (1986), self-efficacy refers to the beliefs people have about whether or not they can successfully complete a task. From analyses of quantitative and qualitative data, findings indicated an increase in students' science achievement and self-efficacy for learning science after their engagement in a computer-enhanced PBL environment; however, no significant changes were seen in their attitude toward science. Students' attitude toward science and self-efficacy beliefs were positively related to each other. Self-efficacy was shown to be a statistically significant predictor of science achievement scores but attitude was not. In addition, when groups were formed based on a median split of attitude and self-efficacy scores, a significant interaction was found. Among students with low attitude, science achievement scores were significantly higher for the high self-efficacy than for the low self-efficacy group, while students in the high attitude group showed no difference in the achievement scores regardless of their self-efficacy grouping. Results suggested that students' self-efficacy towards science learning could be used to predict achievement.

(Keywords: computers, problem-based learning, self-efficacy, attitude, achievement)