

The Effect of Levels of Cooperation within Physical Science Laboratory
Groups on Physical Science Achievement

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Abstract

The purpose of this study was to investigate the effect of the levels of group cooperation on students' achievement during a series of physical science laboratory activities. Six intact seventh-grade physical science classes taught by two teachers, with each teacher instructing three classes, were selected from two middle schools. For each teacher, one of the classes was taught with a traditional approach (no cooperative goal structure). The other two classes were assigned to a cooperative goal structure (role assignment and nonrole assignment). For the role assignment class, each student was assigned a specific role, but students in both traditional and nonrole assignment classes were not assigned roles. The Classroom Observation Instrument in Science Laboratory Activity (COISLA), which includes investigative skills (i.e., managing, manipulating, observing, reading, writing, and reporting); social skills (i.e., discussing, encouraging) and nonlearning behaviors (i.e., waiting, off-task), was used to measure the levels of group cooperation. The grades on lab reports and lab quizzes of students who were taught by the same teacher were compared to assess the effects of the different learning conditions. No significant differences on the students' final achievement were found with respect to the three instructional approaches followed by each teacher. The teacher effect was more significant than either instructional approach on managing, manipulating, observing, reading, and writing behaviors. No significant teacher effect was found for the other behaviors. Only one treatment effect was significant, writing behavior. Overall, the teacher effect was more influential than instructional approach on students' behaviors. In teacher A's classes, reading behavior predicted 21% of students' achievement. However, no significant correlations existed between the 10 collaborative behaviors and students' achievement in teacher B's classes.