How (if at all) does explicit instruction in advanced planning affect computational problem solving in a group? 

We submitted an application to the Human and Animal Subjects Review Committee for oversight; however, it was not for review of the investigation.

We taught certain students (n = 10) advanced planning strategies (goal setting, action planning, and division of labor). Students (n = 50) completed surveys about their typical problem solving process, as well as assistance me in finding placement at Argonne National Laboratory.

Student perception of achievement strongly correlated with teacher analysis of performance (Chang, Tseng, & Lou, 2012). 

The mean number of students using planning techniques was not different between groups, and dividing labor may assist in solving computational problems, but explicitly teaching such strategies does not change the frequency of their use. 

Regression Analyses

Control

Experimental

Validity of Solution

Mean perception of the outcomes of the problem solving process were higher in the control group (Figure 2).

These data indicate that setting goals and dividing labor, skills which are similar to those with which Searle (2013) found children had difficulty solving computational problems in a group environment for high school students.

The mean perceived validities of solutions for control and experimental groups were not significantly different (p = .594). These data indicate that setting goals and dividing labor may assist in solving computational problems, but explicitly teaching such strategies does not change the frequency of their use.

CONCLUSIONS/DISCUSSION

• Students should set goals and divide labor when solving computational problems with a group. 

• Explicitly teaching goal setting, action planning, or division of labor does not affect the usage of those techniques. 

• One should not teach advanced planning strategies as it decreases students’ perceptions of achievement.

• Explicit teaching of goal setting, action planning, and division of labor improved students’ perceptions of achievement, as well as assisting me in finding placement at Argonne National Laboratory.

• Argonne National Laboratory is a U.S. Department of Energy Energy Management, Argonne, LLC

• Centro James Jenkins, Reference and Collection Development Librarian of the U. M. Libraries Information Resources Center, for her assistance in finding journal articles.

• Grace Ebeling of the Illinois Mathematics and Science Academy writing center for her assistance in adding written portions of this project.

LITERATURE CITED


Computers & Education, 58, 303-300. http://dx.doi.org/10.1016/j.compedu.2011.08.005

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We added an experimental lesson on advanced planning strategies (goal setting, action planning, and division of labor) to the lesson for control and experimental groups. 

The mean number of students using planning techniques was not different between groups, and dividing labor may assist in solving computational problems, but explicitly teaching such strategies does not change the frequency of their use.

Individuals who have difficulty solving computational problems in a group environment for high school students.

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