

Proposal for research on educational robotics

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Assessment and Evaluation

Title: Robotics as a tool in blended learning

Research Problem

There is a lack of uniform use of educational robotics in middle school curriculum. Although the application of educational robotics is growing rapidly, there is little research completed on how students use robotics to learn. Holmquist (2014) notes a large void in research particularly as it relates to science, technology, engineering and mathematics. The favorable influence on learning with robotics has been indicated by Barker and Ansorge (2007) and Chambers, Carbonaro, & Rex (2007). Holmquist points out that little quantitative measurements of student interaction while learning with robotics has taken place.

Purpose and Research Questions

The area of focus of this study is how students perceive robotics as a learning tool. Students will use robots to develop a program to operate a device that will solve a problem. The goal is to determine if students can become motivated in science, technology, engineering and mathematics after using educational robotics to solve a problem. Students will be asked to sort soda cans and place them in designated areas based on their color. Interdisciplinary skills including speed, programming, design, measurement and resource management will be applied.

To what extent did students change their view of a robot from a toy to a tool after using it to solve an interdisciplinary problem?

To what extent did students believe that robots can solve STEM problems?

To what extent can robotics be motivating for students in other disciplines?

To what extent do students feel that robotics an effective tool in blended learning?

To what extent do students feel that robotics can help them learn about math and science?

A survey before and after an interdisciplinary activity will ask middle school or high school students their views on what robotics are, how much control they have over robotics, if robotics can help in solving STEM related problems and students potential for a career in robotics. The outcome of the research would contribute to common information of how educational robotics may be assimilated into interdisciplinary lessons offered to students.

Barker, B., & Ansorge, J. (2007). Robotics as means to increase achievement scores in an informal learning environment. *Journal of Technology Education*. 39(3), 229-243.

Chambers, J., Carbonaro, M., & Rex, M. (2007). Scaffolding knowledge construction through robotic technology: A middle school case study. *Electronic Journal for the Integration of Technology in Education*, 6, 55-70

Holmquist, S. (2014). A multi-case study of student interactions with educational robots and impact on Science, Technology, Engineering, and Math (STEM) learning and attitudes.