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SPED727

3/22/12

Evidence-Based Practice Assignment 1

Vaney, M.W., Janoudi, A., Aslam, D.M., & Graham, D. (2012). Building Young

Engineers: TASEM for Third Graders in Woodcreek Magnet Elementary School. *IEEE Transactions on Education*, 55(1), 78-82.

Research Question

While no explicit research question was documented, the articled discusses what effect incorporating LEGO Mindstorms into science, technology, engineering, and math, better known as STEM topics, would have on the interest level of elementary school students in STEM topics.

Methods

The basis of the study came from the Technology-Assisted Science, Engineering, and Mathematics (TASEM) program, which is typically a weeklong program that is offered during the summer. This program focuses on giving students the opportunity to learn about STEM topics through designing and using robots built with LEGO Mindstorms. By using LEGOs, the program incorporates a toy that that most children are familiar with making the subjects more accessible. Most participants of TASEM are elementary school aged, and assumingly from families in the middle to upper echelons of economic status, based on the fact that summer program participants pay to be enrolled.

The study discussed in the article alters the curriculum of the TASEM summer program in order to implement it into a third grade classroom at Woodcreek Elementary School, a magnet elementary school in Lansing, MI. The program has been in place since 2003, and has been used by two third grade classes of about 25 students each. During one hour weekly sessions, taught by university graduate students, students learn about different mathematical and scientific concepts, especially problem solving, and then apply these concepts by building a robot. Following the construction of their robots, the students are required to present their projects in front of fellow classmates, teachers, administrators, and their parents.

Results

Over the course of the seven years that this article covered, the school has seen an improvement in both science and math grades among students who participated in the TASEM program throughout their educational career. Fifth grade teachers were noted as saying that most students who were wen through the program were A or B students in science and math, while other students were low B or C students. The program has also improved standardized test scores in math, increasing the percentage of students who are proficient in math from about 40% to over 90%. There is also evidence that students who participated in the program are more interested in and enthusiastic about STEM areas, even several years after they leave third grade, and that they have retained the knowledge and skills they obtained through the program.

Discussion

In terms of elementary science and math, the TASEM program seems to be something that most schools should strive to implement. Most administrators and educators would love to see the huge jump in math test scores that this program has helped the school to attain. However, it is the hands-on, tangible approach that is the most significant and intriguing aspect of this program. Students are not just learning about different mathematical and scientific concepts, they are implementing them into something they create, which helps them see and better understand the concepts, and in effect stores it in their long term memory. The fact that they, themselves, are designing and creating a robot by using a toy that they are at the least familiar with, and may be extremely enthusiastic about, helps boost interest in the overall STEM topics, which will likely get students thinking about possible careers where they can do this when they grow up (and there is evidence that it already has). Math and science are two subjects that many students do not like because they not only involve concepts that are not used or seen in most people’s everyday lives, but use language and terms that is not commonplace. By making the subjects more accessible, and more fun, for younger students, student interest and understanding will only increase. The TASEM program is definitely one that should be modeled by schools around the country, because it has shown that it can get students to be more interested and do better in STEM subject areas.