Changing Parental Perceptions of Math and Science Curriculum Through Hands-on Workshops

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Purpose of the Study

Many parents hold negative perceptions of math and science because they have never been taught these domains from a hands-on, constructivist approach. Only 20 - 30% of adults have actually experienced activity-based science inquiry. Instead, these individuals were exposed to didactic science programs that emphasize drill, skill and memorization (Shymanksy, 2000). This has had a negative impact upon their content knowledge in these areas and their perceptions of math and science. Consequently, parents are hesitant to incorporate math and science into their home life. There is a dire need to determine if parental perceptions of math, science, and their content knowledge will be positively effected as a result of participation in hands-on science workshops.

Theoretical Framework

Traditionally science has been taught using the top-down model of instruction. This consists of the "passing along" of decontextualized words and sentences from the past. Students are not expected to question or doubt this information, but rather accept it as fact. For most students, this form of instruction leaves gaps in their knowledge and makes understanding difficult if not impossible. Berk explains that learning is an interactive process that is facilitated through the use of manipulatives (Berk, 1999). They can increase student and teacher motivation greatly and are wonderful starting points upon which to build. A hands-on approach is effective in aiding student understanding of scientific concepts, only if the student creates meaning from the experiments or events occurring in the classroom. Programs, such as PALS, engage not only students in hands-on science, but also engage parents by allowing teachers to guide parents as active participants in their children's science education (Shymanksy, 2000). The children take home a science activity bag that is to be completed with their parents. It includes a science lab, materials, instructions, and a correlating piece of literature. Parents who participated in the program reported that discussions of science at home increased, that science labs facilitated their child's understanding of the science content presented at school, and that as a result of the science labs, they became more aware of the science that their child was studying (Shymanksy, 2000).

Method

An action research project was conducted in two urban elementary schools in Miami to address the problem of parental perceptions and content knowledge in math and science. Hands-on science workshops were designed as interventions to this problem. Each workshop addressed a particular science strand and incorporated a data analysis component. Parents and their fifth grade student, who were the target population, are pre-dominantly African American or Haitian American, and the majority of the students are enrolled in free or reduced lunch.

The research design was pre-experimental, one-group pretest-posttest design. It was conducted to evaluate if the independent variable, the science labs, will influence the dependent variable, parental perceptions and content knowledge in science and math. A pre and post attitudinal scale and content exam were the instruments utilized to measure participant gains.

Additionally, home learning was analyzed for completion and accuracy to measure increased parental participation in math and science home learning.

References

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