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Will teachers who collaborate with a science resource teacher in the use of hands-on science activities, increase their students' understanding of science content knowledge?

Are students getting more science (Frequency) because of teacher collaboration and will increasing hands-on science frequency improve student science content knowledge?

Problem

Teachers do not put as much effort into teaching science as other subject areas due to many issues, predominantly anxiety over teaching science. Eighty percent of teachers surveyed felt they were not properly trained in the area of science education and seventy percent felt they lacked the science content knowledge to teach science on the elementary level. Similarly, seventy percent of the teachers surveyed found the Florida Sunshine State Science Standards to be confusing. The challenge is to find ways for teachers to increase students' science content knowledge while using varied techniques of instruction.

Plan of Action

As the science resource teacher at Jack Gordon Elementary, I see students in grades 2-5 for one hour every other week in a fully equipped science lab. During that time students participate in hands-on science activities, follow the scientific method, record and analyze data, and draw conclusions. The remainder of their science instruction is delivered by their classroom teacher. I initiated **TLC** (Teachers Learning and Collaborating) so that teachers could collaborate with me on activities to increase students' science content knowledge as well as learn varied techniques of instruction.

Methodology

Nine 45 minute collaborative sessions introduced teachers to science concepts and activities that they could use with their own students. Teachers were also encouraged to bring hands-on science into their classroom with a "green slip" requesting materials for experiments. Teachers were given Pre- and post science attitude surveys and asked to reflect on each training session. Frequency of

hands-on science by the teachers from last year to this year was compared. Student reflection essays were collected.

Results

Analysis of the data from the general student population showed gains of 25% on FCAT type science content standards. Further analysis of the ESE students showed gains of 30%. Additionally, test data of the lowest performing students in our school showed average gains of 36%. Similarly, individual ESE students all showed gains with an average gain of 42%. When analyzing the pre/post test data, it is clear that the greater the frequency of hands-on science instruction, the greater the science content knowledge will be. This is most evident when you consider that the lowest performing students in the fifth grade population surveyed showed the greatest gains in science content knowledge.

Policy Implications

Elementary teachers who collaborate with a science lab teacher will gain a better understanding and comfort level teaching hands-on science, thus increasing students' science content knowledge. Additionally, students should be given the opportunity whenever possible to take part in hands-on instruction to support their successful acquisition of science content knowledge. Labs should be set up in elementary settings to support hands-on instruction or equipment should be made available for teachers to use in their classrooms. Additionally, professional development must be offered to elementary teachers to give them a better understanding of science content knowledge as well as the use of manipulatives to teach hands-on science.