Community Resources for Science

Summative Evaluation Report

Submitted by

Rockman et al
Independent · Insightful · Informative

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Community Resources for Science

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Scott Burg

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Executive Summary

According to a 2007 report from the UC Berkeley's Lawrence Hall of Science and WestEd, the status of science education in Bay Area schools is weak, often inconsistent, and of poor quality. One finding from this report indicated that external organizations played a key role in supporting Bay Area elementary school science education. According to the authors, many Bay Area districts report receiving critical and high quality support and resources from external community sources. In addition, both multi-subject and science specialists rate the quality of the PD they receive from these external sources higher than those within the public school.[1]

Throughout the Bay Area, many different types of external groups ranging from large academic institutions and museums, to smaller after school and non-profit organizations, provide much needed science support and resource assistance to local schools. Community Resources for Science (CRS) is one such organization.

Our study findings, conducted through surveys, interviews and classroom observations of Bay Area teachers and administrators, strongly indicates that CRS has filled critical gaps in, and has had an appreciable impact on, the quality and quantity of science instruction amongst participating CRS member teachers and their schools.

The specific areas and issues of elementary science education that CRS has addressed are many of the same ones outlined in the 2007 UC Berkeley/WestEd study. These include limited time for science instruction in the classroom, little or poor preparation of teachers for teaching science, and inconsistent and inadequate capacity (resources, etc.) for schools and districts to support science. These issues have become especially acute in light of huge shifts in curriculum and instruction brought about by new curricular standards training and implementation, shrinking school budgets, changing student demographics, and focus on instruction and assessment in 'core' subject areas other than science.

Our core findings are organized around the primary research questions that guided this study.

1) What is the effect of the frequency of CRS resources and programs use on participating teachers' self-efficacy for teaching science? Do teachers who participate

[1] Dorph, R., Goldstein, D., Lee, S., Lepori, K., Schneider, S., Venkatesan, S. (2007). The status of science education in the Bay Area: Research brief. Lawrence Hall of Science, University of California, Berkeley; California.

on a regular basis have greater increases in efficacy, comfort and confidence in teaching science?

In surveys and interviews, teachers in our study overwhelmingly confirmed that participation in CRS has positively impacted their comfort and confidence levels in teaching science. Teachers reported adopting instructional and presentation methods used by BASIS instructors, such as inclusion of diverse visual materials, activating prior knowledge, and integrated writing and drawing techniques as a way of measuring student understanding. By observing BASIS instructors teachers developed a better understanding of how scientists work in the real world and became more motivated to involve their students in scientific practices such as questioning and hands-on activities. The team-taught hands-on experiments were a welcome break from classroom lectures, and gave students greater access to individualized attention and feedback.

Interviewees emphasized CRS' support in helping teachers understand and apply the use of hands-on activities in the classroom. They referenced numerous examples of CRS staff providing resources or assistance for questions related to the linking science activities to other content areas. This support has translated into a level of enthusiasm amongst teachers for continuing to promote and 'push' the amount of science instruction in both lower and upper elementary grades. Interviewees credited CRS for continuing to keep science on their respective school's radar, which was particularly important in light of demands for concentration on other core content areas such as ELA and math.

2) What contextual factors influence teachers' use of resources and participation in CRS programs? Are there barriers to participation in CRS?

Teachers credited CRS staff and volunteers with keeping them informed and up-to-date on the most current science information, materials and teaching methods. They cited CRS staff for having a sophisticated knowledge of science content and education issues, always being available to answer questions, and for continuing to 'push' science as a priority at their schools. Interviewees pointed out that CRS' 'lean' bureaucracy made them easier to work with than other informal educational support organizations, encouraging the school and its teachers to continue to seek out their services.

Teachers cited lack of time and adequate resources as the primary barriers to participation with CRS. In additional to the daily demands of the classroom, teachers also are beginning to address the many changes brought about by Common Core standards training and implementation, and competing demands with instruction and assessment of other core content areas.

3) In what manner and with what frequency do teachers use various CRS resources? Do teachers with access to CRS services "do" more science, or increase the quality or quantity of science they teach?

Teachers and administrators believed that participation in CRS' Science Superstars program helped to promote their schools' commitment to science with students, parents and other members of their school's broader community. They concurred that Superstars' program activities and incentives raised science to a level equal to that of other core content areas, and appropriately rewarded students for all the hard work they were already putting into learning about science.

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Teachers and school administrators remarked that through BASIS lessons, professional development workshops, and other resource support, CRS has provided clarity and invaluable assistance to their schools with Common Core and NGSS training and implementation. This includes support for integration of science across disciplines, and introduction of methods for assessing student skill acquisition and knowledge comprehension.

4) Are students more engaged and do attitudes and knowledge about science and scientists change as a result of participating in CRS programs and activities, especially those who receive BASIS presentations?

Observations of CRS-supported BASIS lessons revealed that, as a result of exposure to scientists and introduction of hands-on activities to support science content in these classrooms, participating students demonstrated behaviors and skills important to science and other content learning such as critical thinking, problem solving, application of research strategies, collaboration, and visual and written interpretation of data. Students participating in these lessons were actively engaged, and demonstrated a self-confidence and positive attitude in their problem-solving abilities.