

What's the BIG Idea: Science and Mathematics at Your Public Library

The project being implemented by the Vermont Center for the Book has made substantial progress toward meeting its goals. Agreements to participate were secured from librarians in four states: Delaware, New York, Texas, and Vermont. Librarians attended a professional development institute in December 2005 where they were introduced to the BIG Idea concepts and materials, provided with a curriculum, and asked to implement the BIG Idea sessions upon their return to their libraries. During the course of the year, librarians also received additional materials in the form of parent kits and ongoing support from their state coordinators and from the staff at the Vermont Center for the Book. A Web site was developed to provide bibliographies and other supplementary materials and ideas for participants.

This evaluation report utilized multiple methods to determine the extent to which librarians implemented BIG Idea programming, the quality of their implementation, and the impact their participation had on their practices, comfort levels, and resource allocation. Perceived impacts on children and their families were also investigated, and materials were rated for the quality of their design. Evaluators collected data using pre-/post-surveys, program observations, librarians and parent/caregiver interviews, coordinator interviews, and analysis of activity reports and materials. Results indicated that the program was very effective in helping librarians increase their comfort levels; implement the programming; acquire new resources; and address early childhood standards in mathematics, science, and literacy. Specific results were as follows:

Motivation to Participate and Preparation

The librarians rated the professional development for implementation as being excellent. Most believed the professional development materials and approaches prepared them well for implementation, stating that the conference was fast paced, enjoyable, and useful. They particularly appreciated the expertise of the presenters and the materials provided to them. A few felt that the institute was too long and some asked for more time for sharing with each other.

Librarians felt well supported in their implementation of the project. Those who met within their states or cities on a regular basis reported that they liked the opportunities to share ideas and information about what worked and how they innovated. All participants felt positively about the support they received from the Vermont Center for the Book.

Implementation

All of the participants implemented the curriculum at least in part, but quality of implementation was uneven. Coding of the activity reports, observations, and interviews showed that using mathematical language, solving mathematical problems, sorting and comparing objects, and making simple patterns were the most frequently used mathematical activities. Engaging in scientific investigations, noting similarities and differences, explaining ideas about the world around themselves, and using clues to make informed guesses were the

most frequently used activities in the area of science as inquiry. Other areas of science were more rare, indicating that librarians implemented what they learned but did not often address other standards on their own.

Literacy and language standards were addressed often. Children had many opportunities to listen to stories, have different types of literacy experiences, and hear a wide variety of literature including nonfiction and poetry.

While some implemented the curriculum as written, many librarians created supplementary activities. In some cases, the supplementary activities served to enhance the children's experiences, engaging them even more deeply in scientific investigations, mathematics exploration, or other related activities. However, more often than not, innovation undermined the children's experiences. The innovations tended to leave too little time to engage in activities fully or to address children's questions. Sessions with innovations tended to be less likely to address standards and were less likely to have elements of quality within the implementation.

Impacts

Statistically significant differences were found in the frequency of librarians' use of 14 activities related to mathematics and science. Largest differences were found for:

- Talking about same and different;
- Making predictions;
- Describing and combining shapes to make new shapes;
- Measuring and comparing sizes, shapes, and events;
- Talking about sequencing and patterning;
- Using comparative words;
- Reading science books and doing science activities;
- Reading mathematics books and doing mathematics activities;
- Matching, sorting, naming, and/or describing objects; and
- Making graphs and charts.

Statistically significant differences were also found in librarians' self-reported comfort levels in working with young children for:

- Teaching mathematics and science skills;
- Using scientific investigations;
- Designing mathematics and science programs; and
- Using prediction activities.

Librarians made more mathematics and science materials available to children and their families, and more professional development in mathematics and science to other librarians. Differences over time for both of these areas were statistically significant.

Both librarians and parents/caregivers reported that children enjoyed the BIG Idea sessions. Parents noted that children were likely to talk about their experiences with family members in their homes. Some parents or caregivers reinforced what was learned, though this was not the norm. Several parents reported that they found particular value in the BIG Idea sessions in the way they felt these sessions prepared their children for kindergarten. They stressed the value of sessions that exposed their children to and got them to enjoy participating in science and mathematics.

All of the participants reported that they were likely to sustain the BIG Idea sessions over time. They liked the programming and materials, noted the positive reaction of the participants, and felt that the value of the programming was high.

Parent Kits

All of the new parent kits were rated highly on criteria for effective instructional design. All of the kits addressed many of the early childhood education standards in mathematics, science, and literacy.

Recommendations for Improvement

The BIG Idea programming was generally viewed as very positive and welcome by all participants. Recommendations for improvement generally addressed support mechanisms rather than content, though a strong suggestion from many participants had to do with the age range of children being served.

- 1. Consider providing information within the curriculum for ways to vary program delivery depending upon the age of those children in the sessions.**
- 2. Provide information on acceptable variation for implementation.**
- 3. Change the format for the reporting requirements.**
- 4. Provide more opportunities for librarians to share among themselves.**
- 5. Package materials in ways that are more user-friendly.**

Many specific suggestions were made by librarians and coordinators for improvement to the BIG Idea program and are included in the report.