

## **Increasing parental sense of efficacy for facilitating their children's mathematical development**

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*Parents with a high sense of efficacy see themselves as capable of assisting their children and capable of overcoming challenges that may emerge during the process. They believe their efforts will make a difference. This paper discusses strategies used by the Esso Family Math Team to provide parents with optimal opportunities to experience an increased sense of efficacy for facilitating their young child's mathematical development.*

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Research from the past twenty years has provided ample evidence that it is important for parents to be involved in their children's education (Chavkin, 1993; Epstein, 1994; Ford, Follmer & Litz, 1998; Henderson, 1988, Onslow, 1992; Sattes 1985). The ongoing challenge continues to be how to enhance this parental involvement, especially in families with preschool and elementary school children.

Hoover-Dempsey & Sandler (1997) reviewed the psychological theory and research critical to understanding why parents become involved in their children's education. Parental sense of efficacy for helping their children succeed in school is a key construct that is believed to be central to parents' basic involvement decisions. Parents with a high sense of efficacy see themselves as capable of assisting their children and capable of overcoming challenges that may emerge during the process. They believe their efforts will make a difference. On the other hand, parents with a low sense of efficacy are likely to avoid involvement for fear of confronting their own inadequacies or because they do not feel their involvement will produce positive outcomes for themselves and/or their children.

It is perhaps in the area of mathematics education that parents, in general, often experience a low sense of efficacy for helping their children (Onslow, Edmunds, Chapple, Forsythe, Burakari-Adera & Waters, 2002). As Onslow et al. (2002) pointed out, most parents want to help their children with mathematics, however, they simply do not believe they have the skills to do so effectively. Not only are topics like probability, statistics, and patterning new to many parents, but the way mathematics is now taught is foreign to them.

### **Esso Family Math Project**

For the past five years, team members at the Esso Family Math Centre, at The University of Western Ontario, have been building on the earlier successes initiated at Berkeley in the 1980's by creating resources, and training volunteers to work in community settings with at-risk parents and their children. In an effort to change parents' negative attitudes toward mathematics, as well as their beliefs concerning their inability to facilitate their children's mathematical development, a series of six Family Math sessions are offered to families with young children. The goal is to help parents understand why mathematics is taught the way it is and to demonstrate how they can help their children to learn mathematical concepts through enjoyable and inexpensive activities that they can easily put into practice at home.

## **Empowering Parents**

The Esso Family Math Team has implemented the following strategies to provide parents with optimal opportunities to experience an increased sense of efficacy for facilitating their children's mathematical development:

### ➤ *The Setting*

Many at-risk parents do not possess the cultural capital associated with schools and often feel powerless in these settings (Lareau, 1997). The Esso Family Math sessions are frequently held outside of the school setting in order to create a relaxed environment where parents and children feel comfortable, can make errors, learn from these errors, make sense of the mathematics they are learning, and grow as a family by having fun and gaining knowledge together.

### ➤ *The Meals*

Each session begins with a meal where families and volunteers share an informal dinner together. Parents and children talk about the introductory math activity which they completed upon their arrival and the home challenges they completed since the last session. Perhaps more important, however, are the conversations with the Family Math volunteers regarding their personal lives. These discussions help to create a positive rapport between families and the program personnel, thus allowing parents to feel relaxed and confident enough to ask questions about the mathematics that does not make sense to them before, during and after Family Math sessions.

### ➤ *The Activities*

Esso Family Math activities rely on concrete representations of abstract mathematical ideas and require materials that are readily available in most homes. Many parents remember math as the tedious task of completing large numbers of worksheets, with answers that were right or wrong. In this program, parents and their children are exposed to the patterns and relationships that are the foundation of mathematics, by playing games from various cultures and by talking about the mathematics that is present in their everyday lives. They are introduced to the notion that mathematical ideas are based on logical reasoning rather than the arbitrary rules so many of them have forgotten, and never understood.

### ➤ *Modeling*

Rather than telling parents how to help their children, Esso Family Math personnel model positive parenting skills and demonstrate strategies to help parents communicate with their children. By playing Family Math games with the families, the volunteers model how parents can invite their children to share their thinking, encouraging them to communicate their understanding (or lack of it) in a secure and stress-free environment. Parents begin to understand why it is necessary to wait for their children to think through a problem, and to refrain from being critical of an incorrect answer, or excessive in their praise of a correct one.

➤ *Where's the Math?*

At the end of each Family Math session, parents meet with a Family Math leader to discuss the mathematics that was uncovered in the activities and games that they participated in during the evening. Discussions take place regarding the value of playing a game, going on a math walk, using manipulatives, exploring patterns on a calculator, reading a math-related story, and/or singing a math-related song. The school curriculum is also discussed to illustrate how Family Math activities are part of, and not just supplemental to, the children's school program. The goal is for parents to feel confident enough to talk with their child's teacher about the school mathematics program, and be active participants in their child's education.

➤ *Transferring to the Home*

Families are provided with "Home Challenges" to complete during the week. Parents are reminded that practice at home is an important component for improving their children's skills and helping them to develop a positive attitude towards mathematics. The families are encouraged to talk about the home activities that they enjoyed, found challenging, or were difficult to understand. This information has assisted the Esso Family Math Team in their efforts to continually adapt the program to meet the needs of the target population.

## **Discussion**

Over 1000 families have experienced the Esso Family Math Program. Parents have consistently indicated an increase in their sense of efficacy for facilitating their children's mathematical growth and development. In a pre-program questionnaire, many parents have reported a strong desire to help their children with mathematics while also stating that their previous experiences with mathematics have been negative. They often describe the mathematics currently being performed in their home as being related to their own job or their children's homework. Many parents of elementary students report that they already have difficulties helping with homework and they certainly do not look forward to helping their children with mathematics in the higher grades. After six sessions of Family Math, parents complete a post-program questionnaire. The overwhelming response is that they now are beginning to recognize that "math can be fun" and "math is everywhere". Case studies confirm these positive responses. As one parent commented:

*I always did as little math as possible. Even helping my son with homework felt like a chore. Thank you for this program. I am really impressed because I am learning, and my mind is more open to math – it is fun! The program is even better than I expected. My family now has regular conversations about math. We talk together about math and it is pleasant. Even homework sessions are more positive and fun. The biggest change is that my son has a more positive attitude towards his math schoolwork. He used to be negative about math but he isn't anymore. He even enjoys me being around when he is doing his math. I feel more positive about helping him. There is less criticism and more helping happening. Family Math has given me an opportunity to change my way of thinking.*

It appears, then, that through a relatively short, yet carefully designed program, parents can begin to increase their sense of efficacy for helping their children with mathematics. It confirms that parents do want to help with their children's education and will do so with enthusiasm if given the tools, the knowledge, and the support to do so.

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