

# **ADOPTED TEACHING STYLES OF PARENTS AS CO-EDUCATORS IN MATHEMATICS A STUDY IN A CANADIAN ELEMENTARY SCHOOL**

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*This study explores patterns of involvement of parents as co -educators of mathematics. Factors influencing attitudes to mathematics and the teaching approaches adopted by parents at different stages of their children's education are considered. The teacher's own perspectives and explanations of varying levels of parental involvement as mathematics co-educators are briefly discussed. Findings indicate that teachers and parents have restricted views of each other's practices.*

## **INTRODUCTION AND THEORETICAL FRAMEWORK**

An established body of research examines the changing nature of the roles adopted by parents within the Home –School partnership, from a minor level of involvement in functional activities to a more active role in supporting the classroom curriculum Bastiani (1987), Epstein (1986), Jowett & Baginsky(1988). More recently the focus has shifted to researching the power relationships within these partnerships and the relative positioning of teachers and parents. Docking (1990), Vincent (1996), Crozier (2000) Interesting developments in the field of home mathematics increased levels of involvement by engaging parents and children in practical activities. Merttens & Vass (1990).

As both a parent and teacher, I became interested in the contributions that professional parents were making to their children's learning in mathematics at home and how much of this remained invisible to the school.

### **Research Context**

This study took place in a single grade entry elementary school in a Canadian city in which recognition was given to the vital role played by parents as partners and first educators. A significant number of parents were active within the school, in various roles including working under the direction of the teacher, supporting children in the classroom.

### **Methodology**

**Parent Interviews** The parent sample included 3 fathers and 8 mothers. The first group to volunteer for interview about the mathematics that they engaged in with their children at home were all fairly confident with mathematics.

At a later date, a less confident group emerged explaining to the researcher that they felt that they had little to offer since they saw themselves as being “hopeless with math”. With encouragement and reassurance they went on to provide valuable insights and contributions to the study.

**Teacher Interviews** were conducted with the school principle and three teachers, one from each phase of education within the school. (Kindergarten, Primary grades 1-3 & Junior grades 4-6) These teachers characteristically had already maximised levels of involvement and interactions with parents within the classroom setting. Data relating to the teachers' perceptions of the factors affecting levels of parental involvement in mathematics education was gathered. A fuller discussion of which, will be included in a more detailed future paper.

## **FINDINGS AND ANALYSIS :**

### **Parents' responses and adopted teaching styles**

Analysis of parental responses led to the development of three categories, grouped according to their attitude towards mathematics, their perceived ability in mathematics and adopted teaching style as mathematical co-educators of their children.

#### **Maths Achievers**

This first group describe their love of mathematics, the confidence with which they manipulate numbers and the pleasure and enjoyment they got from solving a problem. These parents report that early positive experiences as learners of mathematics probably informed their career choices. They exhibited confidence in their ability to support their children's mathematical learning whatever the age of their children and adopted a teaching style independent of the school curriculum. They responded to their children's interest and questions and exploited the opportunities arising from family life to enhance and enrich their children's understanding and appreciation of mathematics.

We have a tendency to exploit the educational value in situations but this may not be the case in every family...for example, not just math books but nature, astronomy, plays...It is important that these enrichment opportunities fit into what is already going on at home...we don't necessarily sit down and do half an hour or a page of a math text book...but they should be extensions of normal family situations.

Mathematical activity and discussion were a natural and integral part of their relationship with their children. Their over-riding wish was to protect this relationship. Some expressed doubts about the formality of approaches adopted in school. These parents were wary in case these experiences engendered negative attitudes towards mathematics in their children

They want to keep home and school separate. They get different things from the two places in their lives and want to keep it that way. If home and school were too co-ordinated it could easily get oppressive for them.

#### **Maths Evaders**

The second group lacked confidence in their ability to manipulate numbers and harboured a deep dislike of mathematics. They recalled negative early experiences as

learners of mathematics and acknowledged that they had maths anxiety. Some reported that they went to great lengths to avoid mathematics, in all but the most necessary transactions in their adult lives. They lacked confidence in their ability to support their own children in mathematics and were anxious not to transfer their own anxiety to them. They worked hard to participate in their children's mathematical education and were keen for their children to have more positive experiences than they had had as learners of mathematics.

I was intimidated by it at school...so I tend to encourage the kids not to be intimidated.

Although the overall level of parental involvement for this group decreased as children move up through the school grades, the pattern of adopted approaches was a complex one, closely reflecting parental attitude, ability and confidence in maths. They often engaged in interesting and creative mathematical activities, particularly with their pre school and kindergarten children. Once their children reached primary years, these parents felt that it important that their children had a good grounding in basic skills. They followed this aspect of the school curriculum closely and felt able to offer support to their children. One parent reported that at this stage, she had personally found mathematics uninteresting, but accepted the need to offer support as part of her wider parental responsibilities.

Just the rudiments – like trying to sort out division. That is something that I do do! And, you know, the big plus and the big minus. I'm the sort of person who would have to check on their work because I'm not big on keeping my attention. I tend to mind-wander because it's boring. I'm good at making sure they check their work.

Once their children entered the junior years, these parents reported that they felt ill equipped to support their children in the study of mathematics. The curriculum content became too complex for them to handle with confidence and they were very concerned not to convey their own dislike of the subject to their children.

They loose me around Grade 5 ... I mean, they do things so differently that I just confuse them ... even their dad, you should see them confuse him, and he's good at math. When they're younger it's OK, but as they get older!

Parents did not relinquish responsibility for their children's learning at this stage but adopted a monitoring role. They became concerned to ensure that their children were actively engaged in mathematics and completing homework assignments on time. However, they tended to avoid teaching situations themselves, preferring to pass the baton to another person, for example another family member or in some cases a tutor. At times parents in this group reported re-learning concepts alongside their older children.

## Maths Advocates

The third group between these two extremes were not as easy to categorise. They valued success in mathematics and considered it to be an important subject. They were moderately confident in using mathematics in adult life and in their ability to support their children's learning in mathematics.

Parents in this group demonstrated an awareness of the nature of learning and the development of their children's mathematical understanding at different stages in their education. This understanding was closely linked to their adherence to the school curriculum and their wish to follow the teachers' lead. These parents emphasised the need for a good foundation in what they described as *the basics* and worked consistently with children of all ages to help them achieve this. Parents often taught concepts and skills such as, number recognition and counting to their children in the Early Years of pre-school and Kindergarten.

Once again these parents demonstrated awareness of the benefits of learning mathematics based on real contexts. One parent described this process as making the connection between school mathematics and mathematics in the real world.

When he was very young, he used to ask me to read licence plates. Finally I asked him if he could read them and, lo and behold, he could! He was 2 or 3 years old then...it used to take us half an hour to get across a parking lot because we would have to read every licence plate on the way.

Once children moved into the Primary Years, parents still stressed the need for a meaningful context whilst, emphasising the importance of developing mathematical thinking strategies. Basic skills practice was viewed as an essential tool rather than the root of mathematical understanding. They also recognised the futility of rote learning. One parent whose child had been encouraged to memorise the times tables at school said:

He went back the next morning and recited them to the teacher. Well he doesn't have a clue! He doesn't understand mathematics at all. He doesn't remember what they are except for being able to recite them out in order. He doesn't understand them

Parents were concerned to adopt the correct method, by which they usually meant the approach currently employed by the teacher. They were more reluctant to teach concepts independently and more likely to follow the teacher's lead and procedures for fear of causing confusion. They were likely to seek specific advice from the teacher with regard to suitable activities, methods and approaches to be adopted, especially if their child was experiencing difficulties

These people are professionals and they have a large body of knowledge and experience ...I have a lot of respect for professional teachers.

As children entered the junior years, this pattern was continued. Parents in this group remained fairly confident about the mathematical content of the curriculum and were willing to reinforce it by playing an active part in supporting homework. However

parents tended to lose their autonomy at this stage of their children's education. They became very reliant on following the teacher's lead and suggestions. In some cases, parents who actively sought advice attempted to adopt and mimic the teacher's style. Some parents were so concerned about causing confusion that they became over-reliant on teacher advice and tended to avoid teaching new concepts or offering explanations to their children.

I think parents can also get it wrong...there are new and different ways to teach and there may even be counterproductive ways to teach.

### **Teachers' Responses**

Teacher's responses are given brief consideration here, with a focus on their explanations offered for varying levels of parental involvement. Teachers in this sample reaffirmed the widely held view that as the mathematics curriculum content becomes more demanding in the higher grades, levels of parental involvement tail off. (Epstein 1986) They agreed that the decline in parental involvement could be pinpointed to the transition point between Kindergarten and the Primary grades. This is not attributed to unwillingness on the part of the parents to offer support to their children but to the demands of the curriculum itself. Teachers perceived that many parents found it difficult to engage with mathematics at this level and to integrate it into family life. Teachers recognised the dominant role that they unwittingly adopted in making increased use of professional language and terminology, which might compound the feeling of alienation experienced by parents.

### **SUMMARY**

In summary, the maths achievers tended to protect their interactions with their children by not engaging to any degree in the school curriculum. They adopted independent and enrichment approaches, whatever the age of their children, much of which remained hidden from the school. The maths evaders developed increasingly conservative approaches to mathematics, conforming to their restricted view of school mathematics and becoming over-reliant on direction from the teachers. (Epstein 1991) The maths evaders probably conform most closely to the teachers' perception of parents in that they generally lacked confidence in mathematics, exacerbated by the increased complexity of the curriculum as their children became older. (Epstein *ibid*)

The teachers in this study acknowledged that parents played a major role in their children's education. However, they acknowledged particular constraints in involving parents in mathematics education. The teachers also demonstrated awareness that despite their best efforts, some groups of parents remain non-participatory. In this they affirmed the widely held view that in general parental involvement in school mathematics can be a problematic area. (Merttens *ibid*) Parents were perceived by teachers as busy people grappling with conflicting demands on their time, with little time to devote their attention to a subject, which they find difficult.

Analysis of parental responses however revealed that parents' perception of their own ability, aptitude and confidence with mathematics varied considerably and had more effect on the level of involvement, than did simply a question of age variance of their children or increased complexity of the curriculum.

## CONCLUSIONS

Parents in this study displayed widely varying practices and levels of confidence as mathematics co-educators. The teachers in contrast tended to view parents as a homogeneous group not engaged in mathematics education due to lack of confidence or other constraints.

These findings suggest that teachers and parents have restricted views of each other's practices. The teachers in this study already had a history of successfully involving parents in the school curriculum. Even for these teachers, parental involvement in mathematics remained problematic and, despite their efforts, exclusionary practices were occurring

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