In the programme, Fun Maths for Parents, adults were engaged in mathematical activities with their daughters. As well as a social interaction, stimulation and self fulfilment, the participating parents gained new insights—even if apparently basic to professional educators—into their ability to motivate themselves in relation to mathematics and to reduce their anxiety about the subject as their confidence increased. Fun Maths for Parents encouraged these parents to take an interest in and help with their daughter’s mathematics learning.

Introduction

The Home School Community Liaison Scheme is a targeted, focused and purposeful resource serving the most marginalised families in designated areas of disadvantage in Ireland (Conaty, 2007). It was established in the late 1990/91 school year at primary level and 1992 at post-primary. The Home School Community Liaison Scheme is built on the theory and practice of partnership and promotes parents, teachers and community agents as partners in the education of young people. An aim of the Scheme is to awaken in parents their capacities to enhance their children’s educational progress, by developing relevant skills and confidences to support their children with their school work (Department of Education and Science [DES], 2006).

The Home School Community Liaison Scheme was established in Ireland in 1990 with the appointment of 30 teachers as liaison coordinators in 55 primary schools in large designated areas of urban disadvantage. The following year the scheme was extended to 13 second level schools which serve the children who already had the liaison service at primary level.

Some of the aims of the Home School Community Liaison scheme are:

• to promote active co-operation between home, school and relevant community agencies in promoting the educational interests of the children

• to raise awareness in parents of their own capacities to enhance their children’s educational progress and to assist them in developing relevant skills.

(DES, 2006, p.126)

The Home School Community Liaison Scheme is based on the principle of partnership between homes, schools and communities. This partnership is characterised as “a working relationship which is characterised by a sense of purpose, mutual respect and the willingness to negotiate. This implies a sharing of information, responsibility, skills, decision-making and accountability” (Pugh, 1989, p. 5).
As a means of establishing such partnerships, home visitation by the Home School Community Liaison Coordinator is a crucial element in establishing trust with parents. The next stage in the advancement of parents’ awareness of their capacities and in fostering their self-confidence is to provide a comfortable milieu such as a Parents Room in the school and/or provision of childcare facilities to make it easier for parents to attend courses and classes that are of interest to them. Such courses and classes vary from:

- curricular areas—allowing parents to help and support their children with school work
- personal development
- aspects of educational development which range from basic literacy to certificate examination subjects and diploma courses.

(DES, 2006, p.10)

A 1997 OECD study, *Parents as Partners in Schooling*, quoted by the Department of Education and Science, referred to the Home School Community Liaison Scheme as:

It is clear from the Irish experience that educational initiatives based in schools can raise the educational level of the adults involved, and result in a general sense of empowerment in the local community. Parental involvement, especially in areas of socio-economic deprivation, does not just benefit the children and the school—it is a crucial aspect of lifelong learning.

(DES, 2005, p. 40)

The paper briefly outlines the rationale behind *Mathematics for Fun* as per the Department of Education and Science [DES] (2006) guidelines. As the project was implemented in her school, the author changed the working title from *Mathematics for Fun* by the Department of Education and Science [DES] to *Fun Mathematics for Parents*, feeling it to be easier to say, more accessible and more readily understood. The author describes the *Fun Maths for Parents Action Project* developed in her school and concludes with some recommendations for consideration in terms of enhancing and further solidifying the programme within the school and beyond.

**Literature Review**

For the majority of adults, mathematics is perceived as difficult. It appears that their beliefs about mathematics are primarily related to their school experiences, and mathematics is experienced by many adults as something that others can do, but that they themselves cannot do—nor do they need it (Coben, 2000). Subsequently, their negative self-image affects their confidence as learners, since mathematical ability is widely considered an indicator of general intellectual ability (Wedege, 2002).

The theoretical framework of this paper is, in the main, narrative. Miles and Huberman (1994) posit that a theoretical framework is an explanatory device which: “explains either graphically or in narrative form, the main things to be studied—the key factors, constructs or variables—and the presumed relationship among them,” (p. 18).

Furthermore Polit and Hungier (1995) describe a theoretical framework as:
efficient mechanisms for drawing together and summarizing accumulated facts ... The linkage of findings into a coherent structure makes the body of accumulated knowledge more accessible and, thus, more useful both to practitioners who seek to implement findings and to researchers who seek to extend the knowledge base. (p.101)

Rationale

The rationale for the *Mathematics for Fun* initiative is supported by the findings and recommendations of all recent research on mathematics carried out by or on behalf of the Department of Education and Science (DES, 2006). Accordingly, activity-based teaching and learning with the use of concrete materials is now a significant aspect of the revised Primary School Curriculum since 1999 and also of the revised Junior Certificate Mathematics Syllabus since 2001 at second level. As the focus of mathematics teaching and learning is to make the subject a hands-on, practical, accessible and enjoyable subject, parental involvement when and where possible is to be encouraged.

The aims of *Mathematics for Fun* are:

- to meet the individual needs of the pupils through hands-on work and parental involvement
- to enhance the parent-teacher partnership
- to help parents understand more fully the challenging nature of mathematics for the pupil as learner and the teacher as tutor
- to break down the fear barrier some pupils may have towards mathematics by bringing fun and variety into the learning process
- to help parents experience at first hand the working school environment
- to empower parents to engage meaningfully in the learning process of young people.

(DES, 2005, p. 50)

It is usual for parents to abstain from any kind of involvement with the school because of cultural norms that discourage interference with teachers’ autonomy (Yao, 1988). Parents are generally not invited to get involved in any activity as regards the teaching of subjects, not least mathematics. As stated in the Introduction by Maass and Schlöglmann to FitzSimons (2002):

Research in many countries shows that people forget most of the algorithms they learned at school. They are left with the feeling that mathematics is useless. And they do not like mathematics because they remember a lot of bad situations at school. (p. xi)

Ellerton and Clements (1989) maintain that the “main lesson learned by most school leavers after years of being forced to study mathematics is that they can’t do it,” (p. viii). Now the Home School Community Liaison Coordinator is encouraged to involve parents and to make it possible for them to connect with the school in a sensitive way. Maass and Schlöglmann continue:

Mathematics education for adults is very important in this situation. Mathematics education should not repeat the past mistakes of school teaching. Adult learners have different knowledge and different abilities. In most mathematics courses or open learning situations adults should primarily get the feeling that this is not a repeat of
the typical school situation that served them badly in many cases. New and better ways of teaching are necessary. (FitzSimons, 2002, p. xi)

One aim of this paper is to illustrate how Fun Maths for Parents challenged the perceptions of the particular adults concerned.

**Fun Maths for Parents**

The author of the paper is a mathematics teacher in an all girls school located in the South East of Ireland. The school was designated disadvantaged status in the 1990s by the Department of Education and Science and came under the remit of the Home School Community Liaison Scheme. Within the school community not all families are identified as requiring the support of the Home School Community Liaison Coordinator. The following criteria are taken into consideration by the Home School Community Liaison Coordinator and if a family satisfies any three of the criteria, they are deemed priority in terms of support, starting with home visits, an integral part of the Coordinator’s work. Urban and rural schools have roughly similar criteria, which include the following:

- Unemployed
- Medical card
- Local authority housing
- Lone parent
- Mother’s education
- Father’s education
- Receiving assistance because of limited means from farm income (rural schools only)

In conjunction with the Home School Community Liaison Scheme, a number of innovative programmes and services have been implemented in recent years, with a view to increasing the involvement of parents and families in education. One of these programmes was *Fun Maths for Parents*, set in, this instance, in a school context, which included parents and students from both rural and urban locations.

**Fun Maths for Parents—Action Project**

The author, together with the Home School Community Liaison Coordinator in her school, initiated and implemented a mathematics programme entitled *Fun Maths for Parents*. The aim of the programme was to allow the parents an opportunity to engage in a variety of mathematical activities similar to those that their daughters would be participating in when in class. The hope of the author was to try to take the fear out of mathematics as a subject, to make it more accessible, practical, and enjoyable but most of all a positive experience for everyone concerned. Such an engagement would then confidently entice parents to look to other means or methodologies of helping their daughters in their approach and attitude to the subject at home.

The *Fun Maths for Parents* programme was intended for parents of First Year students in Junior Cycle. Second level education in Ireland usually starts at age twelve and continues for six years. The Junior Cycle expands on the education received at primary level and ends with the Junior Certificate Examination. The Junior Certificate Examination is taken by students after three years of study and not before fourteen years of age.
The programme was influenced by the reality that the author’s school was a designated school of disadvantage status. The target parent-group was identified in cooperation with the Home School Liaison Coordinator. These parents, had for the most part, spent their young adult and adult life at a great distance from formal and informal education. They expressed reluctance, negativity and a total lack of confidence in their abilities with regard to mathematics. Their comments ranged from:

“I hate maths—I always hated them”

“I keep telling my young one she doesn’t need them—hasn’t she the calculator nowadays”

“My Linda is no good at mathematics, but that’s no surprise I was no good at them myself and he’s no good either—it runs in families”

“I hated school and everything about it—they were all snobs—sure it never got me anywhere”

“I was alright with adding and subtracting even multiplying but when we did fractions it did me head in from there”

“I wouldn’t mind but me granny could mark 3 bingo books together—who needs the rest of it”

Such negativity about themselves, school and mathematics is encapsulated in the following comment, made in the 1986 report from Action Group 7 of ICME 5, about adult education:

[which] often has to cope with the fact that its learner has already failed in mathematics or has a feeling of being a failure. Fear and feeling of fear tend to hinder learning in adult education and render even more difficult adult learning of mathematics (p. 126)

The programme was inspired by the vision that it would be a major advantage to both parents and students that the target parent-group would actually cross the school threshold to take part in a learning programme in a subject deemed by them to be terrifying and alienating.

The Home School Liaison Coordinator discussed the idea of the Maths Programme with the parents on her home visits. She then invited them to come into the Parents Room to meet with the author, who would explain the rationale behind the programme to the parents. A group of six parents responded to the invitation. The author, briefly and clearly, outlined the changes to the mathematics syllabus at Junior Certificate level and the focus that the Department of Education and Science wished to place upon mathematics as a more practical and accessible subject than it had been heretofore, through the introduction of a variety of activities and cross curricular links.

The author then demonstrated two straightforward activities to the parents who reacted so positively they could hardly believe they enjoyed themselves. The activities were:

Monkeys and Bananas

This is a counting game whereby any number containing 4 is replaced by the word monkey and any number with 7 is replaced with banana. The game was intended to teach a familiarity with numbers and with counting and was chosen because it was mixing verbal and numerate skills which demanded an undue amount of concentration and focus. It is a
fun mathematical activity because there is a fear within the game itself of being perceived as stupid and childish. A very interesting outcome of the childlike activity is that fun itself is a by-product of an activity which challenges ones fears.

Odd and Even Card Game

Sets of cards with the numbers from 0–9 inclusive are shuffled and given out to each person. Everybody places their cards in a pile in front of them and turn over the top card. The numbers on the cards are totalled. If, for example, the total is an even number, everybody who turned up an even number scores a point. This game was intended to teach, very basically, the difference between odd and even numbers. It was chosen because it included addition, as a means of introducing mathematical operations, and because of the need to extrapolate information from the operational outcomes which would have a bearing on further actions.

The parents could see immediately how such activities had them thinking in an entirely different way and the skills they had to bring to bear on the activities—listening, hearing, counting, concentrating, adding. They could also see that they could extend an activity such as Monkeys and Bananas to multiples while the Odd and Even card game could eventually include a mixture of operations. However, as a result of the conversation with the parents it was decided that any mathematical operations within the activities, would involve nothing more than addition and subtraction of natural numbers. Only one parent was at ease with multiplication and division of whole numbers, i.e. short multiplication/division that she could calculate mentally. It was crucial that the author worked within the comfort zone of the parents in order to maintain their goodwill and enhance their levels of confidence.

A sensitive induction programme was planned and delivered to the parents over a period of eight weeks. It was sensitive to the fact that these parents had issues in being anywhere near the school building because they considered the school building and the necessity of their being in it as a negative and almost punitive situation. Any visit to the school was perceived by them as an indication that their daughters had either misbehaved or were under performing. Further a visit to the school invariably meant having to part with money for enrolment, uniforms, activities, etc. Money which they did not readily have, so not having to go to the school in any shape or form was considered a positive, as going to the school was associated with fear, risk of embarrassment and financial pressure. These very parents tended not to attend Parent-Teacher meetings as they had prejudged the situation in expecting only to hear bad news. The induction then was planned to persuade these parents that they could come to the school, have a cup of tea, run no risk of negative reflections due to their daughter’s behaviour or underperformance, no money was taken from them and there was the hope that they might in fact enjoy themselves. It was arranged that the group of parents would join the author one day a week in the Parents Room for a forty-five minute session for training in the methodologies/activities. A rota of three parents was set up to return later in the week at an agreed class period when the author had their daughters for class. The enthusiasm was palpable as they immersed themselves in the process.

The mathematical activities outlined in Appendix 1 were organised to include a mix of board games, card/dice games, mental arithmetic games, pen/paper games and calculator activities. Some examples are as follows:
• **Mathzo**

A mathematical form of Bingo. This activity has similarities to adult bingo which is so much a part of their lives at community level and at national/international lottery levels. The main difference is that instead of calling out a series of numbers, the parent had to call out a simple mathematical operation to the participants eg $4 + 3$. The participants then marked off 7 if it was on their cards. The parent, as well as calling out the mathematical operation, also had to quickly do the calculation mentally to ensure that the correct number was marked off on the cards by the participants. The fun element was the role playing as number caller and the jokes derived from the millions in the mathematical funds!

• **Dice game**

Four dice were thrown by the parent. The instruction is to look at all four numbers which appear on the upturned side and to write down (a) the largest number possible from these four numbers and (b) the smallest number possible from these four numbers shown on the dice. Options can be varied by instructing the participants to choose only two or three numbers for the tasks. There is a familiarity and a fun element in rattling the dice in a cup. It renews positive childhood memories of games like Snakes & Ladders or Ludo and it allows for an entertainment factor while the dice is being rattled—how long the person takes, the faces they make, the blowing on the dice for luck which draws on superstition as does gambling in general, walking around the chair, calling on God. This is a performance in somewhat mock heroism, which frees the participants from both fear and self-consciousness.

The parents were now ready for the next step. It was decided that the parents’ participation should not be a hermetically sealed activity. The author evaluated the activities in terms of how efficient and how well the participants had grasped the essence of the methodology. As soon as they had reached the stage of absolute comfort within the performance of the methodology the author knew they were ready to present these methodologies in class formats to the student body which included their own daughters. It was understood from the outset and would have been a motivator in the practice that an objective of acquiring these methodologies was that the parents would present once they had gained the efficiency. The student group was brought to the Parents Room—a huge treat for the students to get out of the classroom environment. The student group was divided randomly by the author into three groups. Each group, eight students approximately, sat at a large round table with a parent. The author explained to the group that each activity session would last for approximately ten minutes. Then each group would move to a different table to engage in a second activity for the next ten minutes, followed by one more movement of the groups for the final ten minutes, thereby giving each student an equal opportunity to experience all three of the activities.

Understandably, the parents were a little apprehensive. However, once the proceedings started, it was as if they were doing this all their lives. Feedback from the parents and their daughters was hugely positive and their enthusiasm to continue with it was inspiring. They spoke of:

“I never thought I could ever teach anybody anything about anything”

“I can’t believe I’m teaching first years maths when I didn’t even finish Primary School”

“The time flew”

“God, teaching is such fun”
“You know, at this rate, I could come to school every day”

“I was so terrified of them, I thought they’d be shouting and roaring but you know they were so interested and the smiles on their faces at the end is something I’ll never forget”

“I was scared I’d make a right fool of myself in front of my daughter and all her friends but when Linda said to me, Mam the girls think you’re a great teacher, I nearly cried”

The parents grew into their role so quickly and as a result their confidence began to develop. They were delighted to come to the school and took great pride in telling their own friends about the programme they were involved in. They reported going to the library to look at books and further games as well as asking the librarian to help them with websites for mathematical activities. The fact that they were in a milieu in which they were comfortable was very important. Over the eight weeks, in the debriefing sessions after the activities, there was such an air of excitement among the parents—they had smiles on their faces, they had put smiles on the students faces, they could see other ways that some of the games could be manipulated and changed to advance to another level, they could now see that they could encourage the students to engage in and suggest other ways the games could be played and to take this on board during the session. The approach to learning mathematics through a variety of methodologies gave the parents a whole new perspective on that part of mathematics in which they were comfortable. In addition to developing their skills and self-confidence, they were also subjected to an enjoyment of learning that was not available to them in their day.

The response from the students to the whole experience and to having their parents take an active and public role in their pedagogic systems was phenomenal. They found it good fun to follow and engage in the activities with the parents:

“Well Miss, I nearly died for Mammy when she told me she wanted to do this thing but she was savage—all the girls are mad about her”

“Oh Miss, it was great fun for us to get out of the classroom and to have all the mammies teaching us, not just ye”

“Well you know what we mean Miss—it’s like you learn kinda different”

“Miss, are the mammies coming in everyday now?”

Towards the end of the school year, the achievement of these parents for their participation in Fun Maths for Parents was celebrated by awarding them publicly with a certificate of participation at the Presentation of Certificates for Parents Day. For all of the parents involved this was a very proud occasion for them as they had never experienced any form of graduation for themselves. Indeed for their students it was also a very proud occasion.

Conclusion and Recommendations

The Fun Maths for Parents programme, in the author’s school, has provided an opportunity for progressive change in education, that is, equal participation and partnership between pupils, teachers and parents in the classroom. There was a sensitive induction planned and delivered for the parents. They were trained in various mathematics methodologies/activities by the author who pitched the modules to suit their life-experience. The enthusiasm was palpable as they immersed themselves in the process. Their confidence grew accordingly. They were then ready for the next
step: presenting these methodologies in class formats to the student body which included their own daughters. The response from the students to the subject and to having their parents take an active and public role in their pedagogic systems was phenomenal.

Unfortunately *Fun Maths for Parents* had to be cancelled for the last two years due to building logistics within the school grounds. Now that the logistics have been resolved the following recommendations will be put forward by the Home School Community Liaison Coordinator and the author:

- The establishment of a new Parents Room—a designated space where parents can come especially on the initial visits, have a cup of tea, avoid the whole school glare and simultaneously feel relaxed and special.
- The target student groups in the initial programme were usually the two weakest class groups – deemed by their entrance examinations and assessments as weak at literacy and numeracy. The author would like to introduce the programme throughout the school year and include all of the First Year classes because the involvement of the parents and methodologies and their deliverance proved so successful that it can only be of benefit to all students in the year group whether they are considered highly numerate or not. Each student should be given an opportunity to experience the fun quotient.
- The realisation that parents of disadvantaged status may be, in the main, financially disadvantaged, but there are also those parents who left school early for their own reasons and may possibly feel educationally disadvantaged. These parents are, for the most part, uneasy and uncomfortable with education even though they are very keen for their children to have an education that will help them to realise their full potential. So, it is recommended that the programme be extended to invite other parents who are not financially challenged or disadvantaged but who feel incompetent with regard to mathematics.
- If possible and indeed reasonable, the author would like parents to continue with Fun Maths for Parents into Second Year. There is a very dynamic team of mathematics teachers within the Mathematics Department who are quite capable of training the parents comfortably into advancing their mathematical skills.

**References**


Appendix 1: Activities for Parents

- **Countdown (pen & paper activity)**
  
  Based on the British TV programme. The parent presents a random selection of numbers to the students with a given total. Using addition, subtraction or a mixture of both operations students have to work out the given total using all the numbers. Eventually this activity can become a timed activity giving it more gusto.

- **Fizz Buzz (mental/oral activity)**
  
  Similar to the aforementioned Monkeys & Bananas—Fizz Buzz is based upon multiples of a given number. The parent decides the number. The students start to count. When a student lands on a multiple of that number, it must be replaced with the words Fizz or Buzz in alternative sequence.

- **Art & Mathematics—a mathematical picture jigsaw to be finished at home**

- **Silent Tangram**
  
  An A4 sheet cut into shapes of various sizes, presented to the students in an envelope. Working in pairs and in silence, the students had to make up the A4 page. When completed the students had to put up their hands and the parent would check the tangram with a template.

- **Board Games—Your Number’s Up**

- **I have...Who has...?**
  
  Game with cards. On the top half of the card is a statement, on the bottom half is a question e.g. I have 3. Who has this number plus 7? All the cards are linked and so the first student to clear all her cards is the winner.

- **Eliminator (mental/oral activity)**
  
  Students stand in a group. The parent selects two of the students and poses a calculation to them. First student to answer correctly can eliminate anybody in the group who must then sit down. The last student standing is the winner.

- **Calculator Activities**

  Words on calculators—activities are presented to the students with calculator work involved. On turning the calculator upside down the students can read a word. As a follow up to the activity, words on calculators are presented to the students by the parent and the students must present a calculation to the parent (work in teams of two students).