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## **Parental Involvement in mathematics : the home as a social factor.**

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***Abstract**    Both in the USA and in Britain it has long been demonstrated that the socio-economic background of the home the largest single factor in determining children's educational attainment. However parents' active support and involvement in children's education can make a major difference. This paper describes IMPACT, an educational initiative in which parents are systematically involved in their children's learning of mathematics through the use of weekly teacher selected take home tasks. Starting in 1985 with 12 elementary schools in inner London, the project now runs in over 3000 schools across England, Scotland and Wales. It is the largest project of its kind in Europe, and , in addition to the intervention programme, IMPACT supports a flourishing research centre. Drawing upon some of the research findings , this paper will describe how the programme works, the percentages of parents who participate and some of the effects upon children's learning.*

The IMPACT Project was started in 1985 as an attempt to mirror the work of the shared reading initiatives in the area of maths. The late 1970's and early 80's had seen the establishment of a substantial body of evidence, gleaned from both research and practice, of the efficacy of involving parents in their children's learning to read through a programme of regular reading at home and sustained dialogue between teacher and parent about the child's progress (Topping & Wolfendale, 1985, Hamilton & Griffiths, 1984) . The mechanisms by which this dialogue was maintained usually included small 'reading diaries' completed by parents and children at home and, responsively, by the teacher in class.

IMPACT is an educational initiative in which parents are systematically involved in their children's learning of math through the use of weekly

teacher-selected take-home tasks. From a beginning in 12 elementary schools in inner London, the project has spread to over 3000 schools across England, Scotland and Wales. It is the largest project of its kind in Europe, and, in addition to the intervention programme, IMPACT supports a flourishing research centre<sup>1</sup>.

Impact activities fall into two types. The first type are those that require the child to collect some data. This can then be collated, analysed and represented back in the classroom. An example of a data handling activity is 'Telephone calls'. The second type of practice or develop a skill. An example of this is the activity called 'Money bags'. These two activities are detailed below :

IMPACT is, in a sense, another name for homework in that children take a mathematical task and share it at home. However, there are three important differences between IMPACT and the ways in which homework is traditionally conceived and executed.

1. IMPACT activities are designed to be shared. They require that the child talks to someone, either to play a game, or to collect some data, or to make or do something. Typical IMPACT activities include:

<p><u>Telephone Calls</u>      Count and record the telephone calls that arrive at your home over a weekend. Who do you think will get most calls ? Design a tally sheet to keep by the phone. Who got the most calls ? Who spent longest on the phone ?</p>
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<sup>1</sup> For further information about this project see Sharing Maths Cultures, Merttens, R & Vass, J. 1990 Falmer Press. London, UK. or Partnerships in Maths, Merttens, R. & Vass, J. 1993 Parents and Schools, Falmer Press, London, UK.

**Money bags.** How much would you have if you had one of every note and coin that is legal currency ? Ask as many people as you can. 10 seconds to give a guess. Work it out. Who was closest ?

2. Parents are not being required to teach maths. All they are required to do is to support their child's learning, to talk through a task or to act as a resource. Sometimes parents help by supplying skills children have not yet developed. ( for example, cutting out or sticking )

3. The results of the maths activity which is shared at home are brought back into the classroom and are elaborated by the teacher in the course of the subsequent week's classwork. This is of crucial importance in that it provides parents with a direct means of influencing or commenting upon the classroom curriculum. Traditionally, homework was perceived as very much an additional activity - the class lesson the next day proceeded regardless if one had failed to complete one's homework, except, of course, for any disciplinary action which might ensue. By contrast, the IMPACT task is embedded within the classroom maths curriculum although its actual performance takes place in the context of the home.

A crucial aspect of this process is represented by the IMPACT diary. This is a small diary, divided into sections, in which parents and children comment upon the task undertaken at home. This provides a mechanism whereby parents can and do make assessments of their child in relation to clearly specified mathematical skills. The diaries also enable a sustained parent-teacher dialogue to develop over an extended period of time<sup>2</sup>.

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<sup>2</sup> For more information about how to set IMPACT up in a school see "The IMPACT INSET Guide", Merttens, R. from the IMPACT office, University of North London, UK.

IMPACT has been subject to detailed monitoring and research evaluation from its inception in 1985:

1. A two-year period of intensive monitoring and research in 3 LEAs with 36 schools. This included weekly visits to schools, a large quantity of interviews with teachers and parents, observation of teacher practice, the completion of diaries by children, parents and teachers, and video-taping in a sample of parents' homes.
2. As the scheme has spread to an increasing number of schools across the UK, we have monitored annually the progress of IMPACT in a sample of schools through questionnaires and teacher records.
3. Independent research on IMPACT has been carried out by a number of LEAs and Master's and doctoral students in various institutions.

**Results:** We are able to present evidence that IMPACT works successfully over a number of years and with schools in different regions and widely differing catchment areas. There is evidence to suggest that children's performance in maths is improved - in some cases quite substantially - and that their attitude to maths becomes more positive. The response rates, in terms of the numbers of parents and children regularly taking part are extremely encouraging with well over 80% of families in a typical infant (grade 1 -4) class responding. Interestingly, the response rate does not appear to be related to the socio-economic class of the parents in the catchment area of the school. However, the teacher emerges as an influential factor here - an enthusiastic teacher can get nearly 100% of the families involved.

**Significance:** The IMPACT project is the largest and certainly the fastest growing project of its kind in Western Europe. The demand for traditional homework in primary schools is increasing, due to the pressure on teachers to improve standards of numeracy, and also to the desire on the part of many parents to support their child's learning in what is now perceived as a

competitive educational market place<sup>3</sup> . IMPACT provides a radical alternative to traditional homework. It succeeds in raising standards, encourages sustained parent/teacher dialogue and, crucially, is not socially divisive in the fashion of traditional homework.

**Qualitative Research findings:** We were concerned to illuminate what teachers perceived as the problems and benefits of involving parents in maths. This automatically raises the question of teacher's perceptions of parents and of parental attitudes to maths in particular, and to young children's learning in general. This is a crucial issue to which we shall return.

We looked at why teachers had wanted to start IMPACT in the first place, what they felt about it once it was up and running as a way of working, and what their feelings were about the long term effects of this type of non-traditional mathematics homework.

All of the teachers who took part in this particular piece of research said that they saw IMPACT as a means of raising the standard of pupils' attainments in maths. They were also keen to improve home-school relations and to bring about a better dialogue between parents and teachers. Most said that having some support had been a major factor in enabling them to start this sustained programme of parental involvement in their school and that this support could come from a variety of places. Colleagues – in their own and other neighbouring schools – were mentioned as one important source, and the Local Education Authority was mentioned as another. Surprisingly the head teacher ( principal ) was less important than these two.

Once the IMPACT programme was up and running the teachers very quickly felt the benefits. In summary:

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<sup>3</sup> For further research on these changes in education in the UK see Woods, P. 1993 ' The notion of the Consumer Citizen' in "Ruling the Margins : Problematising Parental Involvement", Eds Merttens, R and Vass, J. available from the IMPACT office, University of North London, UK. and Hughes, M. et al, ' Parental Involvement, Rhetoric and Reality' in the same publication. Another source of information is Munn, P. 1993 'Parental Involvement in Education', Routledge, London, UK.

- children talk a great deal more about their maths, and about mathematical conversations and events which take place in the context of the home,
- children developed a much more positive attitude to their maths, and appeared more confident as a result,
- children were experiencing more of particular (and important) areas of maths –in particular data handling and representation, and practical activities, including games and investigations,
- children – especially infants – were almost all extremely keen to do their IMPACT and, in most cases, it was them who cajoled their parents into doing it rather than the other way round,
- the shared maths at home stimulated work in other areas of the curriculum, especially in science and language,
- the parents became far more involved in the child's everyday routine mathematics work. They also became much more aware of, and realistic about, what their child could and could not yet do.

The problems of running IMPACT included a number of issues surrounding the question of resources, and also a perception of some parental comments as extremely negative and therefore very discouraging. This was a much discussed point, and one which could lead to some interesting further research. We have been impressed by the apparent gap between parent's perceptions of their children's learning of maths, and their ideas about their progress, and what teachers appear to believe parent's think. When teachers were asked to describe a supportive and a non-supportive parent, they generated a series of stereotypes, in which a lack of support was correlated with qualities such as making negative comments about the activities. The whole question of 'What teachers think parents think about teaching and learning' seems to us to be at the heart of much of this work in the area of parental involvement – in particular in the field of mathematics. The



questions of teachers' orientations to parents, and how they construct what is a 'good' parent', are, we feel, crucial to our understanding of how parental partnership programmes can act to improve children's opportunities and attainment in education.

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