

Enhancing primary literacy and mathematics through home-school knowledge exchange

Children learn about literacy and numeracy in two different worlds, home and school. Yet the knowledge which exists in each of these worlds is often not fully recognised or understood in the other. In this project we helped teachers, parents and children find new ways of exchanging knowledge between home and primary school. We looked at how this process of knowledge exchange could enhance children's learning in literacy and mathematics.

- There are substantial 'funds of knowledge' in homes and communities which can be used to support children's learning. They are often embedded in national and ethnic cultures, and in the experience of family members. Popular culture is an important influence on children's funds of knowledge.



Schools need to recognise these funds of knowledge and find ways of making them more visible in the classroom and in the school. Videos, photographs and shoe-boxes of significant items can be used to make this knowledge more tangible.

- Simple activities can help exchange knowledge between home and school. They can make parents more knowledgeable about what happens in school, and help teachers understand more about children's out-of-school lives.



Home-school knowledge exchange activities need to be tailored to the particular home and school communities which they are trying to connect.

- Home-school knowledge exchange activities can have a positive impact on teachers, parents and children, and on attainment in literacy and mathematics.



Educational policy-makers and primary school leaders should give greater priority to exchanging knowledge between home and school, as a means of improving home-school relationships and raising attainment in literacy and mathematics.

The research

What we did

The aim of the project was to work closely with teachers, parents and children to develop, implement and evaluate the impact of home-school knowledge exchange (HSKE) activities. The research had three main strands. This Briefing focuses on the strands concerned with literacy and mathematics. A further Briefing will focus on the third strand, which was concerned with facilitating transfer from primary to secondary school.

In both the literacy and mathematics strands, HSKE activities were developed and implemented in four 'action' primary schools. In each strand, two of these four schools were located in Bristol and two in Cardiff. No school was involved in more than one strand. Within each city, one school had a higher proportion of children eligible to receive free school meals (HFSM) while the other had a lower proportion of eligible children (LFSM), an indicator of relative affluence. In both strands we tried to ensure that the school intakes reflected the ethnic diversity of the two cities. We also worked with a set of 'comparison' schools which were matched with the action schools, but did not carry out any action in them.

In each strand, an experienced teacher was seconded to work part-time on the project. The role of these 'teacher-researchers' (TRs) was to work alongside school staff developing HSKE activities and supporting their implementation. In the literacy strand the TR worked with a cohort of children from the start of Year 1 to the end of Year 2. In the mathematics strand the work involved a cohort through Years 4 and 5.



Photo 1: A display of children's literacy work mounted in the entrance hall of a local supermarket

What we found

Funds of knowledge to support literacy and mathematics

There are considerable funds of knowledge in children's homes and communities which support their learning of literacy and mathematics. Children

take part in a wide range of activities outside school which involve literacy, mathematics, or both. Games such as Monopoly involve reading and following instructions and making mathematical calculations, while household activities such as shopping involve writing lists, reading labels, and calculating change. Moreover, children and their families do not usually consider they are doing 'literacy' or 'mathematics' when they engage in such activities.

Children also engage in activities at home which look more like school literacy or mathematics, such as carrying out homework set by the school or working through commercially available exercise books. Often parents feel unable to help with such school-like activities because the methods and approaches currently taught in their children's schools differ from those they themselves learned. One covered up the pictures in his child's reading book as he thought that using them to deduce meaning was 'cheating,' although many teachers nowadays feel that using pictures to help interpret the text is an important strategy in learning to read.

Some of the funds of knowledge on which children draw have clear ethnic origins. In our research, several families of Asian origin used the traditional practice of strand counting, in which family members counted on their fingers using finger-joints to represent one unit. Members of the extended family often played a key role in passing on this kind of knowledge. One child who was learning Punjabi at her local Gudwara was given strategies for memorizing the letters by her grandfather, as she 'couldn't keep them in my head'.

Children also draw extensively on their knowledge of popular culture such as TV programmes, films, nursery rhymes and books such as the Harry Potter series. In the area of literacy, this knowledge could be seen in their emerging understanding of features of narrative, such as genre, character and plot. Neither the children's teachers nor their parents seemed fully aware of the influence of popular culture on children's literacy learning.

Activities which take school to home

We worked closely with teachers and parents in the action schools to develop a programme of HSKE activities in each school. Some of these activities were intended primarily to convey information or knowledge about the school to parents and other family members. We developed a number of ways of doing this:

- Guidance sheets, booklets and newsletters were produced which gave information about the curriculum and teaching methods in literacy and mathematics. These were translated into community languages where appropriate.
- Videos were made which showed the children in their classrooms learning about aspects of literacy and mathematics. Sometimes these videos were accompanied by voice-overs

or booklets explaining why particular methods were being used. Showings of the videos were held at school for parents and other family members, and all families in the literacy strand received copies of the videos to play at home.

- In one case, many parents were reluctant to come into the school for various historical reasons. So the school mounted an exhibition of literacy materials, including children's work, in the entrance hall of a local supermarket. This provided easy access for parents and extended family members who would not normally have attended such events in school.



Photo 2: Shoeboxes can be used to bring into school important objects from home

Activities which bring home into school

We also developed activities which brought into school information or knowledge about children's lives outside school.

- Children used disposable cameras to take photographs of relevant aspects of their out-of-school lives. In the literacy strand, the photographs related to class topics such as 'living things' or 'the local environment'. Their photographs were later used in writing activities at school, in some cases involving parents and siblings. In the mathematics strand, the children took photographs of out-of-school activities which involved mathematics in some way (eg reading a timetable or setting the video). The children then discussed the photographs at school and wrote captions explaining how mathematics was used in each activity.
- Children in the literacy strand used shoeboxes to bring in personal possessions and artifacts from home (such as favourite toys or photos of themselves as a baby). These were used by teachers to support literacy and other activities across the curriculum.
- One school in the mathematics strand developed a concerted strategy to involve a group of Bengali-speaking parents who were reluctant to approach the school. Individual parents were visited at home by the teacher-researcher and a bilingual teacher, and were invited to attend a meeting at school where parents' views about

what they wanted were elicited. Some of the parents subsequently came into school to make and play mathematical games with their children. Specialist English and ICT classes were also set up for parents.



Photo 3: A group of Bengali-speaking parents playing maths games with their children in the classroom

Impact of the knowledge exchange activities

The HSKE activities were on the whole well received by the teachers, parents and children who participated in them. Parents felt that the school-to-home activities had made them much more knowledgeable about what and how their child was learning in school. The videos in particular had provided a 'window' on to their children's other lives. One parent said: 'It opened my eyes to how they learn'

The home-to-school activities were also positively received by the teachers. One teacher reported how the shoebox activity had a dramatic effect on many of the children's writing, which she called 'literacy breakthroughs'. In another school the shoebox activity led one teacher to reflect more deeply on her own practice: 'If you look at these boxes you can see all the differences in just a small group of children ... all too often this diversity is closed down in schools. Do we make them conform too much?'

Some of the activities were continued or developed in the schools after the research was completed. The shoebox activity was used in one infants' school as a way of helping children manage the transition to junior school. It provided a device whereby the junior school teachers could quickly get to know their new children. The work with the Bengali families also had a lasting impact, with many more parents becoming involved in school activities as a result of the initial impetus provided by the project.

There was some evidence that the knowledge exchange activities were having a positive effect on children's attainment, but this was not found uniformly across the project. In the literacy strand the children who experienced HSKE activities made significantly better progress in Cardiff, but not in Bristol. In the mathematics strand, the effect of HSKE activities on children's attainment was positive but not significantly so.

Major implications

Funds of knowledge to support literacy and mathematics learning

Helping children learn about literacy and mathematics is not simply about teaching basic skills in school. It is also about recognizing that much learning in these areas takes place out of school, as children use their emerging literacy and mathematics skills in a wide range of everyday contexts. The crucial task for both parents and teachers is to help children make meaningful connections between the different kinds of literacy and mathematics which they encounter inside and outside of school.

The substantial 'funds of knowledge' in children's out-of-school worlds can be drawn on to support their learning in school. Teachers need to find ways in which they can identify, recognise and make use of these funds of knowledge to support children's learning in the classroom. This requires a fundamental shift of perception amongst teachers and educational policy-makers – from seeing parents in terms of how far they can support classroom learning, to seeing them as a source of knowledge about their children's out-of-school learning.

Home-school knowledge exchange – the principles

Schools should be encouraged to draw up a programme of home-school knowledge exchange activities based on the following principles:

- All families possess important 'funds of knowledge' which can be drawn on to enhance children's learning in school
- Communication needs to take place in two directions, from home to school as well as from school to home
- One size does not fit all and home-school knowledge exchange cannot be imposed in a uniform way. Some excellent ideas that have been tried and tested in one context may not work in other settings
- Diversity amongst children and families is an opportunity and not a problem. Exploring the richness of children's home lives can be a highly motivating stimulus for learning in school.
- The importance of children's own knowledge should be recognised in the process of HSKE

Home-school knowledge exchange in practice

Putting HSKE into practice can be facilitated in the following ways:

- Build on what is already happening. It makes more sense to develop current activities than to opt immediately for groundbreaking innovations
- Build on successful activities. If something works then it makes sense to extend it and take it further rather than branching off in a different direction

- Start with school-to-home activities before home-to-school activities. Many schools will be on more familiar ground with school-to-home activities, while home-to-school may seem novel and threatening
- Use different methods for communicating – such as videos, photographs and displays in novel areas – rather than relying only on the written word
- Don't write off so-called 'hard to reach parents'. It may simply be that no one has yet found the best way of communicating with them
- Respect children's right to privacy. While most children appreciate having one aspect of their lives recognised in another location, some children may feel anxious about exposing aspects of their home lives to their peers and teachers. However, we found that many of these anxieties could be dispelled by sensitive handling on the part of teachers
- Be prepared to take risks. Some activities – such as making a video of classroom practice for parents - may feel particularly threatening to teachers. Yet the benefits of opening up in this way will far outweigh the possible drawbacks

Home-school knowledge exchange – the benefits

Schools which take on the challenges of HSKE are likely to see a range of benefits for teachers, children and parents. Teachers can appreciate the additional knowledge they acquire about children's out-of-school lives and can use it to enrich the literacy and mathematics curricula. Parents can acquire a greater understanding of what is happening to their children in school, gain a greater appreciation of teachers' professional skills, and realise how they can complement the work of the school at home. Children can appreciate when aspects of their out-of-school lives are valued and respected in school, and when their work at school is better understood at home. As one parent commented about her child: 'I think she likes to show people things about herself and I think she really enjoys that...yeah I think she really liked to do that'

Further information

Books

One book has been published by Routledge 'Improving Primary Literacy: Linking Home and School' and a further book is expected: 'Improving Primary Mathematics: Linking Home and School'. Both will provide a full account of the literacy and mathematics strands, with detailed descriptions of HSKE activities and advice for practitioners on how to implement them.

Articles and book chapters

- Greenhough, P., Yee, W. C., Andrews, J., Feiler, A., Scanlan, M. & Hughes, M. (2005) Mr Naughty Man: Children's Learning From Popular Culture. In J. Marsh and E. Millard (eds) *Popular Literacies, Childhood and Schooling* pp 45-76. London: Taylor and Francis
- Winter, J., Salway, L., Yee, W. C. and Hughes, M. (2004) Linking Home and School Mathematics: The Home School Knowledge Exchange Project. *Research in Mathematics Education*, 6, pp59-75.
- Andrews, J., Yee, W.C., Greenhough, P., Hughes, M. & Winter, J. (2005) Teachers' Funds of Knowledge and the Teaching and Learning of Mathematics in Multi-Ethnic Primary School Classrooms: Two Teachers' Views of Linking Home and School (2005) *Zentralblatt fur Didaktik der Mathematik*, 37, no 2, pp72-80.
- Greenhough, P., Scanlan, M., Feiler, A., Johnson, D., Yee, W. C., Andrews, J.A., Price, A., Smithson, M. & Hughes, M. (2005) Boxing Clever: using shoeboxes to support home school knowledge exchange, *Literacy*, 39, no 2, pp97-103

Special issue

A special issue of the journal *Educational Review* (Volume 58, no 4, November 2006) is devoted to home-school knowledge exchange and contains six articles on aspects of the project's work.

Project website:

www.home-school-learning.org.uk

Project team:

Martin Hughes (project director), Jane Andrews, Anthony Feiler, Pamela Greenhough, David Johnson, Elizabeth McNess, Marilyn Osborn, Andrew Pollard, Mary Scanlan, Leida Salway, Vicki Stinchcombe, Jan Winter, Wan Ching Yee. John Bastiani, Guy Claxton, and Harvey Goldstein acted as project consultants.

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The warrant

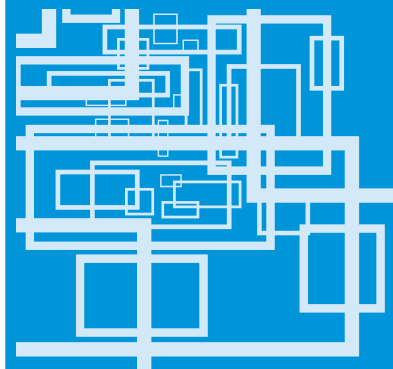
The project used two main methodological approaches – quantitative and qualitative – as the basis for any claims arising from it.

Quantitative data were collected on pupils' attainment, using the PIPS test developed at Durham University, and learning disposition, using the ELLI test developed at the University of Bristol. These data were collected from the whole cohort of children in both the action and comparison schools, a total of around 270 children in the literacy strand and 330 in the mathematics strand. The data were analysed using multi-level modeling software (MLwiN) under the supervision of the project consultant Harvey Goldstein. In the mathematics strand models were constructed of the relationship between attainment scores over time and other factors such as action/comparison, city, free school meals and gender. In the literacy strand the presence of two schools where the testing was done in Welsh precluded an overall analysis for the strand, so various pairwise ANCOVAs were carried out. Non-parametric approaches (Mann Whitney and Wilcoxon tests) were also used in data analysis.

More qualitative investigations were carried out with six target families from each class. These involved interviews with parents, teachers and children, videos of literacy and mathematics events at home, and observations of children in school. This work was extended through case studies selected from amongst the targets. These qualitative data were analysed using frameworks developed in previous work by Martin Hughes, Pamela Greenhough and Andrew Pollard.

The project's advisory group consisted of academics, policy-makers and practitioners with considerable experience in the home-school area. This group was used as an extensive sounding board for findings as they arose from the project. Individual project publications and the end of award report also received rigorous examination from other academics working in the field.

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