

“It’s a massive confidence boost having your mum or your dad there”: discovering attitudes and barriers to parental engagement in mathematics with school age students

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It has long been recognised that parental engagement has a large and positive impact on children’s learning (Desforges and Abouchar, 2003). But how can we tap into this powerful resource when it comes to the nation’s favourite ‘love-to-hate’ subject – mathematics? While general parental engagement faces large barriers itself – time restraints, parents’ own experiences of school, confidence etc. – parental engagement in mathematics seems to face a whole host of additional barriers including the low level of mathematics skills and high level of mathematics anxiety existing in the UK adult population. In 2013, National Numeracy launched a research project into parental engagement in mathematics. Focusing on areas of deprivation, National Numeracy explored attitudes, experiences and concerns of parents, teachers and students. This paper discusses barriers and recommendations that emerged from this research.

Keywords: anxiety, attitudes, engagement, parents/carers, user voice

Introduction to the parental engagement project

National Numeracy (NN) was founded in 2012 after a number of calls for a stronger focus on numeracy in the UK (Moser, 1999; New Philanthropy Capital, 2010; Department of Business, Innovation and Skills, 2012). Since being founded, this need has been further outlined by reports showing that the UK is falling behind internationally when it comes to numeracy (Wheater, Ager, Burge, & Sizmur, 2013; OECD, 2013). NN use the international description of mathematical literacy to describe numeracy, which allows us to focus on tackling very poor numeracy skills and on improving life outcomes for many people:

Mathematical literacy is an individual’s capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual’s life as a constructive, concerned and reflective citizen (OECD 2006, p.12).

Research suggests that parents engaging with their children’s school learning is essential for maximizing their learning potential (Desforges & Abouchar, 2003). For this reason, parental engagement is of great interest to NN; parents/carers can have large influence on a child’s attitude to and attainment in mathematics. Supporting children’s maths education can also serve as motivation for parents/carers to improve their own skills.

The main aims of the parental engagement project are to support parents/carers in engaging with their children’s mathematics education, promote positive attitudes to mathematics, and to provide support to parents/carers who wish to improve their own numeracy. The project was split into research and pilot phases; this paper discusses the research phase. This included extensive desk research and consultation of key stakeholders: children, parents/carers, teachers, and members of

an expert group whose members had a variety of professional experience in mathematics, parental engagement and family learning. Consultation took place through a combination of focus groups, meetings and online surveys. Key areas to emerge from this research have been: division between classroom and everyday mathematics, the potential impact of parental engagement on achievement; existing barriers; current strategies to engage parents; and recommendations for improving parental engagement in mathematics.

Literature review

Parental engagement has a large and positive impact on children's learning (Harris & Goodall, 2007). However, a distinction should be made between 'parental involvement' and 'parental engagement' – where parents are involved in school (activities such as attending shows, sports days, etc.), these activities are not explicitly supportive of learning and have little impact on achievement (Department for Education, 2010). While measuring impact on achievement is complex and findings have been mixed, some research and projects have found a relationship between improved parental engagement and improved attendance, behaviour and achievement (Achievement for All, 2013). Desforges & Abouchaar state that at-home good parenting has "a significant positive effect on children's achievement and adjustment even after all other factors shaping attainment have been taken out of the equation" (2003, p.4). This effect is stronger than that of either socio-economic status or mothers' qualifications (Melhuish, Sylva, Sammons, Siraj-Blatchford, & Taggart, 2001). Additionally, fathers' engagement is particularly important for boys and disadvantaged children (Oxford School Improvement, 2010). However, there is not unanimous agreement on the effects of parental engagement on children's achievement. In 2013 a Nuffield Foundation report concluded that current research into the impact of parental engagement has not produced enough concrete and reliable evidence (Gorard & See, 2013).

Existing research documents barriers to parental engagement, generally and within the subject of mathematics. Common barriers include cultural beliefs, effects of low socio-economic status, time constraints, confidence and skills, language and communication, and school-based barriers. We expand on these below:

Cultural beliefs: it is socially acceptable in the UK to profess an inability to cope with mathematics (Williams, 2008). Other cultural barriers include parents/carers' perception of their role within education – Lupton (2006) states that many parents believe education is something that happens at school, not at home.

Effects of low economic status: as schools make more use of technology, families with low socio-economic status face further barriers regarding access to technology and the internet (Harris & Goodall, 2007). Additionally, middle class families are more likely to "have culturally supportive social networks, use the vocabulary of teachers, feel entitled to treat teachers as equals, and have access to childcare and transportation" (Harris & Goodall, 2007, p.27).

Time constraints: across social classes, work, family commitments and time restraints can impact on parents/carers' ability to engage (Harris & Goodall, 2007).

Confidence and skills: Parents/carers' confidence with their own mathematics skills and negative experiences of mathematics at school can have a large impact on their willingness to engage (DfE, 2010). Furthermore, some report feeling deterred from engaging by other parents (DfE, 2010).

Language and communication: confidence with language can also impact parents/carers with English as an additional language, as well as those who are unfamiliar with mathematical terminology (Harris & Goodall, 2007).

School based barriers: sustainability of projects within schools (Harris & Goodall, 2007); parental engagement not being a part of teacher training (Campbell, 2011); and failures in the system also further hinder successful parental engagement (Achievement for All, 2013).

Field research and consultation

To further our understanding of barriers to parental engagement in mathematics and to inform the development of some pragmatic solutions to trial later in the project, we conducted original research using a mixed methods approach. We ran a series of focus groups and distributed an electronic survey. This allowed us to hear the user voice from parents/carers, students and teachers.

We ran focus groups at schools in the Isle of Wight, Bristol, Weston-Super-Mare, London, Birmingham and Grimsby. There was an average of 10 attendees at each group, excepting the Birmingham group where 70+ parents/carers attended. Following the barriers already identified by the research, we wanted to specifically attend to the issues experienced by those with a low socio-economic status. We conducted two online surveys – one of teachers' and one of parents' views and experiences. The sample for the parents' survey was recruited through the following channels: Mumsnet (45%), social media (18%), network of expert groups and partner schools (38%). These gave us a breadth of views, although there is some bias in that these respondents will have access to the internet and be computer literate, and are motivated to respond to online surveys about mathematics education.

Parent focus groups

With parents we explored feelings and attitudes towards mathematics: how they speak about mathematics around their children; what they currently do to support their child's learning of mathematics; what stops them from feeling able to support their child; and what kind of support they would find useful. We can expect some bias in the field research findings: comments reported here are made by parents who have the confidence to come into school and discuss mathematics with strangers.

The majority of parents/carers saw mathematics as valuable in everyday life, and considered mathematics qualifications – mathematics itself less so - to be important for future employability. When compared to literacy, most parents/carers were very happy to support their child's reading but viewed teaching mathematics as the school's job, and they did not recognise the valuable everyday activities they already do with their children as mathematics. The most common barrier that parents mentioned was the new methods of teaching mathematics – this left them feeling unconfident in their ability to support their child. While the majority stated that they tried to be positive about mathematics around their children, there were high levels of anxiety around mathematics and negative feelings due to their own experiences at school. Parents also mentioned feeling intimidated by other parents - whom they perceived to be “more articulate, confident and clever”- as well as teachers. They reported being wary of school contact as they expected home/school communication to be regarding problematic behaviour. One parent compared being disengaged to being unemployed – the longer you stay away, the harder it becomes, but after taking

the initial step fear can be overcome - “they [other parents] don’t come [to school] because they’re scared – as soon as they come they’re not scared any more”.

Respondents felt that it needed to be made clearer to parents/carers the impact that their support could have on their child, and that this should be communicated in a positive way – some mentioned feeling “bored of always being wrong”. Parents/carers volunteered several ideas of what they would view as useful support. These included: guidance on mathematical language and how methods are taught in school; improved home-school communication on curriculum and grading; parent and/or family numeracy workshops; and clear, simple, online/paper ideas for everyday mathematics conversation prompts/ activities to do with their children.

Student focus groups

At one of the early parent/carer focus groups, we engaged with a group of Year 5 and 6 pupils, again asking them about their attitudes towards mathematics and how they and their parents/carers engaged in mathematics together. This provided some important insights so student focus groups then became a regular part of our school visits. We asked the schools to select students and include those who may struggle with mathematics.

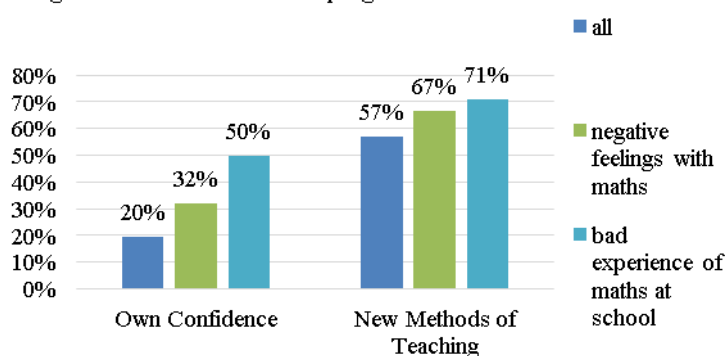
The primary school student focus groups all declared enthusiasm for mathematics. All students recognised the importance of mathematics and felt they would need it “to get a good job”. Many could list jobs where they thought they would use mathematics in their everyday work. They reported they were either already involving their parents in their learning or would very much like to. The majority were happy to work with a parent and one mentioned wanting more homework “to bring parents and children closer together”. Most expressed a liking for mathematics and especially for ‘a challenge’. A few were not comfortable with the idea of their parents/carers’ involvement and the most common reason for this was discussions ending up in arguments, e.g. “doing mathematics alone is more peaceful – parents just take over”. Children also mentioned differing methods as an issue.

Secondary school students gave a more mixed set of responses. Only a small number of students (all girls) were prepared to say that they engaged with their parents with mathematics. The majority of participants in these groups did not want to share mathematics with their parents. Again, it was seen as a source of confrontation - “when parents help, it just ends up in a massive fight”. Students linked this increase in conflict to the difference in methods but also to a general change in relationships with parents at that age. They stated that it was easier to talk to parents when at primary school. Others lacked confidence that their parents could help them with their mathematics. Only one boy was able to say that his parent learns when he learns.

Online surveys

When we asked parents whether they felt they were able to be positive about mathematics around their child, a large proportion (69%) selected ‘always’. Interestingly, on segmenting this by the parent’s own feeling about mathematics, we discovered a large difference. We separated out those who said they had completely positive feelings towards mathematics and those who reported some negative feelings. Over 80% of those with positive feelings had selected ‘always’, yet only just over 40% of those with some negative feelings towards mathematics had selected ‘always’. We would like to segment further; however the current sample is too small.

Figure 1. What inhibits helping child with maths?



More than half of parents struggled with new methods of teaching. Those who had bad experiences at school or had generally negative feelings towards the subject also reported their own confidence with the subject as a barrier.

We asked parents how they would prefer to be supported in helping their child with mathematics, and found that they would prefer provision to be either online (60%) or in the form of workshops (45%). A large proportion of all parents would like to have more help with tips to help their children learn (78% across the whole sample). A smaller proportion of parents wanted to have help with their own mathematics skills (about 20% across the whole sample). This rose to roughly 30% for those with negative feelings towards mathematics. Almost half of parents who had negative experiences of mathematics at school wanted to improve their skills.

Within the teachers' survey, we asked a number of questions about parental engagement and its efficacy, as well as their insights into barriers and support wanted. Here we present the findings of 53 responses by teachers. This is not a random sample; the majority of the respondents of this survey are from two schools where parent and student focus groups had taken place. When asked to score out of 5 'Do you believe that parents helping pupils with their homework leads to good outcomes?', teachers scored an average of 4.21 out of 5. Just under half (25) scored this at 5/5. No teachers scored this at 1/5. In terms of barriers to parental engagement, teachers cited work commitments and a lack of interest from parents as the largest barriers, and parents' own confidence and skills. When asked what form of support would best work for engaging parents (teachers were allowed to pick more than one), the most popular form was 'workshops', followed by 'online'. This is in contrast to the parents' findings who overall preferred 'online' to 'workshops'.

Conclusion

Parental engagement can be a very powerful tool in education, but there are complex barriers which are further increased when the engagement is in reference to mathematics. Anxiety about mathematics is common among parents/carers, and new or different mathematics methods have exacerbated their feelings of helplessness. Parents who report having negative feelings towards mathematics or had bad experiences with mathematics at school also find it harder to be positive about the subject in front of their children. Many parents/carers reported feeling intimidated by other parents, the school, and work that children bring home. Children and parents/carers reported mathematics causing conflict. However, we found that respondents saw mathematics as valuable, although in some cases the value of mathematics qualifications was felt more strongly than the value of mathematics itself. There was enthusiasm from both parents/carers and children for opportunities for mathematical activities and conversation in everyday family life.

The purpose of this research was pragmatic in informing the development of intervention materials for parental engagement in mathematics learning. The research helped us to formulate recommendations that any new resources for parental engagement in mathematics should transform attitudes; enhance the parent/carers' role as first educators for their child; help parents/carers to see mathematical opportunities in everyday life; and support them in developing the vocabulary, language and questioning skills to maximise their child's learning. We will report on the development and trialling of such material at a later stage.

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