



nationalnumeracy.org.uk

Final report

PARENTAL ENGAGEMENT AND FIRM FOUNDATIONS
FOR ALL

National Numeracy
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Section 1: Agreed outcome targets

1. National Numeracy (NN) has completed an analysis of the need, and developed a clear understanding of current and potential new pedagogical approaches and resources to help low attaining adults to develop their numeracy skills, including an understanding of the potential benefits of, and issues with, using a structured approach to teaching 'number sense' to adults (with findings and recommendations to be documented in a report).
2. A new approach to supporting low attaining adults to develop their numeracy has been developed and trialled, with the impact and efficacy of the approach evaluated and reported on.
3. National Numeracy has completed a review of current resources and support to enable parents to engage more positively in their children's maths education and improve their own attitudes to and understanding of everyday maths as a result (with findings and recommendations to be documented in a report).
4. Promising approaches to support parental engagement in numeracy have been identified and trialled, with the impact and efficacy of the approach(es) evaluated and reported on.
5. Recommendations have been made for how National Numeracy and other organisations can best take forward the most promising approaches identified for helping low attaining adults and parents to develop their numeracy skills, including recommendations for scaling up effective practice.

This final report covers points 2, 4 and 5 - 'Phase 2'. Please see the Interim Report submitted to the Paul Hamlyn Foundation (PHF) in April 2014 for detail on points 1 and 3 – 'Phase 1'.

Section 2: National Numeracy

Work funded by the PHF fits well with other activity. Firm Foundations for All aims to support people with the lowest numeracy skills who are not yet ready for the Challenge Online, and therefore extends our reach across levels. Parental Engagement complements our existing range of school improvement work. Both projects feed into our ongoing attitudinal work and tie in with our work to improve numeracy skills across the age range. These projects are central to our mission and have been key to our activity over this last period.

National Numeracy has grown considerably over the recent period. Any type of growth brings with it new challenges for an organisation which NN has dealt with by devising new management structures and lines of responsibility. We have dealt with recruitment in house and have been successful in securing high quality staff to contribute to our ongoing work.

At the end of the financial year (31 December 2014) National Numeracy had reserves of £276,036.00, plus £190,000 of designated funds, and restricted funds of £467,537. Current budget income for 2015 is £913,600.00, which includes income from bids currently in the due diligence phase. In addition, we have bids currently submitted which are not included as they are still in initial stages. We are currently working on a three year plan.

New relationships have been forged with many partner organisations through the work of the National Numeracy Challenge: public and private sector employers, workplace, community and education organisations: including Nationwide Building Society (NN funder), Portsmouth City Council, TUC unionlearn, Nottingham University Hospitals NHS Trust, Merseytravel, the Workers' Educational Association and a number of public libraries. NN has also worked with government departments across the UK, key sector individuals through the National Numeracy Forum and our co-secretariat of the APPG on Maths and Numeracy. NN has also started to develop new strategic

partnerships with a number of organisations, including City & Guilds, Oxford University Press and Achievement for All. We are now part of the Fair Education Alliance, supporting the publication of its inaugural Report Card outlining the state of educational inequality in the UK.

The Trustees' Annual Report was approved by the trustees at their meeting on 31st of March 2015 and we will forward it to you at the earliest opportunity. This will give further details on all of the above. The activities undertaken by National Numeracy are all in line with our aims and objectives and within our existing budgets and forecasts.

Section 3: Parental Engagement

Overall, we have identified and trialled promising approaches to parental engagement, measured impact, and have a clear idea of further developments and research questions for future phases.

Focus groups and a literature review conducted in the research phase of the project indicated various complex barriers in parental engagement. Main themes include: cultural beliefs, socio-economic factors, time constraints, confidence and skills, language and communication, school based barriers e.g. sustainability. We created the following to target these issues:

A website - the [National Numeracy Parent Toolkit](#) includes resources, information, and signposting for parents/carers, schools/other organisations in relation to effective activities and approaches that break down barriers in parental engagement with maths.

A weekly maths challenge scrapbook – the 'Family Maths Scrapbook' encourages mathematical conversations and activities between children and parents/carers. Piloted in school years 3 and 4.

A leaflet – available to download from the site. Key messages are 'locked', and there is also an editable section which schools populate with their own ideas.

Pilot materials – we developed surveys, interactive audit forms, and a platform for sharing information and ideas between pilot schools (using Google Drive).

The pilot trialled the creation and implementation of a parental engagement in maths strategy using these resources. We piloted with seven primary schools and three secondary schools based across the South East, North East, Midlands, and South Wales from September 2014-February 2015. The structure of the pilot was:

1. Survey parents, staff and pupils regarding attitudes to maths and parental engagement.
2. Using survey analysis and the Parent Toolkit, schools create and implement their strategy for parental engagement in mathematics.
3. National Numeracy support and advise schools during creation and implementation.
4. At the end of the pilot in February, schools survey again to measure impact.

Quantitative and qualitative feedback was collected through expert reviews, school visits, regular phone/email contact, start and end of pilot surveys, and monitoring the Google Drive.

'Parents' includes both mothers and fathers, natural or birth parents as well as step-parents and parents who do not live with their children, but have contact with them and play a part in their lives. 'Parents' also includes grandparents, foster parents, and others in significant caring roles.

Impact

Note: Figures exclude those who abstained from answering the question.

- 90% of parents who used them rated the scrapbooks as "Good" or "Excellent".
- 89% of staff feel that taking part in this project has helped break down barriers to parental engagement in their school. 95% believe progress is sustainable.
- 72% of parents feel more able to support their child with maths.
- The number of staff who say they never engage parents in their child's learning has fallen from 22% to 10%. Staff who say they often engage parents rose from 17% to 42%.
- 95% of parents and 98% of staff said they would recommend the Parent Toolkit.
- 75% of children who used the scrapbook said it helped them talk to their parents about maths.

"[It's] been lots of fun. Made me try and find maths in everything"
- Parent

We have identified three key successes and three key challenges on this project:

Success	Challenge
Attitudes: raised the profile of maths within schools, provided space for moving from fixed to growth mindsets, improved communication between parents, teachers and students.	Communication: maintaining engagement, overcoming IT barriers, EAL. Solution: differentiate contact depending on need. Allocate funding to translation.
Materials: we provided useful and accessible resources. The scrapbooks particularly raised enjoyment of maths.	Data: collection and return of surveys, sampling. Solution: further develop data collection methodology.
Project structure and data: the initial surveys proved invaluable in guiding strategies and measuring impact.	Primary/secondary divide: difference in needs of primary and secondary schools. Solution: create differentiated approaches.

The future

This work will continue. Funding will be sought to develop ideas and resources further and carry out another pilot to gather stronger data on impact on achievement. We are also discussing a similar project (building on current learning) with the Mayor's Fund for London. We aim to develop the scrapbooks so they can be sold and eventually to offer a family engagement service to schools. See full analysis of the project, including detail on recommendations for next steps, in appendix A.

Section 4: Firm Foundations for All

Overall, we have identified and trialled a new approach to supporting adults at EL1 and EL2, measured impact and have a clear idea of developments and research questions for future phases. Focus groups and a literature review conducted in the research phase of the project indicated various complex barriers which arise in adult numeracy education. Main themes include: focus on skills rather than conceptual understanding; attitudes, confidence and anxiety; sparse research base (including around digital resources); assumption that structural apparatus would be too babyish for adults; funding, training and access barriers. In order to target these issues, we:

Number sense is a person's general understanding of numbers and operations and the ability to handle daily-life situations that include numbers. This ability is used to develop flexible and efficient strategies (including mental computation and estimation) to handle numerical problems' (Der-Ching Yang et al, 2007).

- trialled with adults the use of structural apparatus that have proved successful in developing number sense in children but that are not yet widely used in adult learning e.g. Numicon™, Cuisenaire™, Base 10. These resources provide a ‘visual representation of number’, allowing students to more easily understand the concepts that underpin the number system.
- produced and trialled Firm Foundations Teaching Materials - an extensive teaching guide for use alongside structural apparatus that includes background, resource familiarisation information and activity suggestions, with a focus on number and numerical operations at the lower levels.

We piloted with tutors at four sites – Leeds City College, Brighton Friends Centre, Prince’s Trust Hackney and Kennington, and HMP Humber - from October 2014-February 2015. Qualitative feedback was gathered through site visits, regular phone/email contact, expert reviews, tutor-student interviews and pedagogy expert-tutor interviews.

Learning

- Structured resources have a key role in developing conceptual understanding in adults with low levels of numeracy. A significant element in success is the confidence and positive attitude of the adult tutor.
- Adult learners respond positively to using hands-on resources and are in favour of continuing to use such resources. The only site that reported negative feedback was the prison; we recommend that more research be carried out in this setting.
- Adult numeracy tutors’ teaching practice has been developed, and they are also in favour of continuing to use the resources and the teaching materials.
- Adult numeracy tutors need detailed teaching materials which outline clear progression in the development of conceptual understanding, and training in order to make full use of structured resources and teaching materials.
- Teaching materials need further development to align more to Functional Skills curriculum, include more subject knowledge e.g. on the importance of number sense, a glossary of terminology, more on developing good pedagogical practice, more on non-number aspects of mathematics e.g. shape, and include more adult contextual problems.
- A companion digital resource would be effective in settings such as prisons, or where funds for buying hands-on resources are limited.

“The resources help me to get a sense of feel for the numbers instead of just numbers on paper.”
- Adult learner

We have identified three key successes and three key challenges on this project:

Success	Challenge
Context: considering the issues and instability rife in adult education contexts, plus the range of sites that we worked with, the project has been very successful.	Data: use of survey questionnaires was adversely affected by low levels of literacy, collection issues. Solution: in future develop data collection methodology. Better train partners on data collection.
Findings: we found that structural apparatus has a clear role in adult education, despite assumptions it would be too ‘babyish’.	Numicon: unintended consequence in terms of perception that NN ‘pushed’ Numicon over other resources at start – off-putting to some. Solution: be mindful of this in future and ensure equality of focus on a range of resources.
Working with tutors: we informed teaching practice, and one site has offered to pay for further CPD.	Expert Group: would have benefitted from a wider range of expertise in Expert Group. Solution: in future ensure digital expert is included and continue to search for experts in this field.

The future

This work will continue. We believe this approach has considerable potential and we will be seeking funding for the further development of materials, a digital resource, and a follow-up pilot to collect stronger data, in particular around impact on achievement. See full analysis of the project, including detail on recommendations for next steps, in appendix B.

Section 5: Finance

The main differences between the budget submitted to the PHF in March 2014 and the final project budget are:

- a) Consultant costs were increased to cover some research dissemination activities and also in order to better support the extension of the pilot e.g. the writing of new scrapbook activities, adjusting the FFfA evaluation method, and additional pilot site visits.
- b) Project co-ordinator costs were increased in order to reflect increased responsibility. The project co-ordinator became full time across the two projects as roles expanded beyond co-ordination to cover development activities such as data collection and copywriting. This reduced staff costs elsewhere. The data analyst's time was also included in this section of the budget.
- c) Resource and trial costs were decreased on FFfA as we had budgeted for paying pilot partners, however 3 out of 4 pilot partners did not charge for their time. Additionally, we decided not to professionally brand and print the Teaching Materials at this point in development.
- d) Parent micro-site costs were decreased through simplifying some aspects of the site e.g. we did not include a 'log-in' function or an interactive audit within the site itself. The web developers also offered charity discount.
- e) A small overspend was incurred on these projects, which has been covered from core.

Section 6: Dissemination

During this phase, we disseminated parental engagement findings from the Interim Report at the British Society for Research into the Learning of Mathematics (BSRLM) conference in November 2014. Following this conference, we submitted informal proceedings to the BSRLM, which has been published online on the [BSRLM website](#).

This report will be shared with our Expert Groups and published on the National Numeracy website after review by the PHF. We are speaking about the findings of the parental engagement strand at the Association of Teachers of Mathematics (ATM) conference on 1st April 2015. Additionally, parental engagement will be the focus of the next National Numeracy Forum, which will be held on 21st April 2015. We will seek to further disseminate evidence and recommendations gathered from these projects at events and conferences in the future.

Signature:



Name and role: Sarah-Jane Gay, Project Co-ordinator

01/04/2015