EVALUATION OF THE *CATCH UP NUMERACY* PROJECT

INTERIM REPORT ON THE RESEARCH AND DEVELOPMENT STAGE OF THE PROJECT

A report for *Catch Up*

August 2007

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FOREWORD

In January 2007 I was invited by Julie Lawes, the Director of *Catch Up,* to undertake an evaluation study of the new *Catch Up Numeracy* project which had just been established with the support of the Esmée Fairbairn Foundation. The project was to run over a period of two years and establish the intervention in pilot schools in invited local authorities throughout England and Wales. Its goal was to make a major contribution to improving the standard of numeracy of pupils in primary schools in England and Wales.

In the first instance I was requested to provide an interim report for the period February to July 2007 on the research and development stage of the project in 40 schools in six local authorities in England and Wales and four in the Oxford area.

The following evaluation report seeks to provide an informed assessment of the work undertaken in the action research stage of the project. I hope that this report will commend itself to the Directors of the Caxton Trust and make a valuable contribution to the further development of the project, in preparation for the implementation of a fully developed *Catch Up Numeracy* intervention in the autumn term of 2008.

1 INTRODUCTION

1.1 The success of the *Catch Up Literacy* project which was established in 1998 has been such that schools and local authorities have expressed interest in a possible *Catch Up Numeracy* project. The Caxton Trust/*Catch Up*, for its part, decided to fund a feasibility study on the possible development of a *Catch Up Numeracy* project. This study covered a review of existing research, an examination of DfES programmes and activities, and two interventions: the first called *Mathematics Recovery* and the second *Numeracy Recovery*. The *Numeracy Recovery* project was initiated by Dr Ann Dowker, lecturer at St Hilda's College, Oxford, and university research lecturer at the Department of Experimental Psychology. The feasibility study also sought to ascertain whether the *Catch Up Numeracy Project* could be delivered by teaching assistants (TAs) as well as by teachers.

1.2 Ann Dowker's approach fitted in well with the approach of *Catch Up* in that

- it is process and research based
- it can be delivered by teachers and teaching assistants
- it integrates all of the fundamental aspects of numeracy
- it requires one 30-minute intervention per week and causes minimal disruption to the classroom
- it has the potential to be an educationally productive and economical intervention.

Following discussions between Ann Dowker and key players at *Catch Up,* it was agreed that a proposal would be submitted to the Esmée Fairbairn Foundation in order to develop and trial a two-year *Catch Up Numeracy* programme and that Ann Dowker would be invited to be the Numeracy Research Consultant to the project.

The research approach

1.3 Ann Dowker's research had identified the following nine components which form the key building blocks in the achievement of numeracy by children in primary schools, particularly those at the top end of Key Stage 1 and the early years of Key Stage 2:

- counting procedures
- counting-related principles and their application
- written symbolism for numbers
- understanding the role of place value in number operations and arithmetic
- word problem solving
- translation between arithmetical problems presented in concrete verbal and numerical formats
- derived-fact strategies in addition and subtraction
- arithmetical estimation
- number fact retrieval.

Ann Dowker's approach to improving numerical competence was trialled in some primary schools in Oxford by teachers who had been briefed and supported by her. The identified pupils (mainly six- and seven-year-olds), drawn from those who were having problems with arithmetic, were withdrawn from their classrooms for 30 minutes per week over a 30-week period to receive tutorial support in those particular components in which they had been found to have difficulty. This one-to-one tuition programme was to lead to significant improvements in the arithmetical performance of the boys and girls involved in the project. This approach, which sensitively complemented the *Catch Up* approach, was enshrined in the Caxton Trust proposal to the Esmée Fairbairn Foundation.

The action research stage

1.4 In December 2006 the Esmée Fairbairn Foundation approved the proposal, thus enabling the project to be developed over a two-year period in schools in local authorities in England and Wales, commencing early in 2007. The initiators then had six weeks to write and publish the training and assessment materials.

1.5 Over 50 local authorities were invited to consider joining the first stage of the *Catch Up Numeracy* project and 21 of them duly expressed an interest. Subsequently, six local authorities (Brent, Hampshire, North Tyneside, Powys, Sandwell and the Vale of Glamorgan) were invited to participate in an action research stage between February and September 2007 in preparation for the introduction of the second stage of the project in September 2007.

Forty schools from the six local authorities agreed to participate in the project, as shown in the table below, together with four schools from Oxford which had been involved in Ann Dowker's initial research.

Local authority	**Number of schools**
Brent	6
Hampshire	8, including 2 special schools
North Tyneside	6
Powys	8, including 1 secondary school and 1 Welsh-medium school
Sandwell	6
Vale of Glamorgan	6

Subsequently, two schools withdrew from the project and only one Oxford school took part.

1.6 In each of the schools involved in the action research stage, six pupils were identified: four who would participate fully in the intervention and two as a control group. It was intended that all of the pupils involved in the intervention would receive one-to-one assessment and tutorial support from March to July for two 15-minute withdrawal periods per week. Within the

control group, one pupil would experience one-to-one support in improving their learning but not using the *Catch Up* approach, while the other would receive more generalised support in aspects of their learning.

1.7 The aim of the action research stage was to offer the initial cohort of volunteer schools the opportunity to participate in training and briefing with a view to establishing *Catch Up Numeracy* in each of the schools. Having identified the pupils who would participate in the intervention, the teachers and TAs involved would then undertake formative pupil assessments in the nine components and administer Standardised Tests (Basic Number Screening Tests A and B), as well as undertake practical activities and guidance with the pupils involved.

1.8 The initial cohort of pilot schools in each of the local authorities concerned were offered, through their headteachers, the opportunity to participate in the action research stage of the project. Following a briefing for headteachers and other teachers in a leadership role, the headteachers readily agreed to commit their respective schools to participate in this stage.

Training

1.9 At this point in the establishment of the project Graham Sigley, with the support of the local authority coordinator, organised two half-day training sessions in late February and early March for teachers and TAs drawn from the volunteer schools. These training sessions focused firstly on the aims and mode of operation and secondly on the nine components and the application of the assessment instruments.

2 MANAGEMENT AND STRUCTURE OF THE PROJECT

2.1 The overall coordination and management of the *Catch Up Numeracy* project is invested in Graham Sigley. In particular, he has initiated the developments that produced the action research plan and has brought into the project the six local authorities and 40 schools in which the *Catch Up Numeracy* intervention has been implemented. Graham Sigley is accountable for his responsibilities to the *Catch Up* Director, Julie Lawes, and the Caxton Trust board of trustees.

2.2 He is supported by the Numeracy Research Consultant, Dr Ann Dowker, and Communications Consultant, Wayne Holmes. In turn Ann Dowker has the support of two research assistants, Peter Morris and Chongying Wang, who collect data from schools for the British Ability Scales (BAS).

2.3 In establishing and developing the project, Graham Sigley has led the briefing of and consulting with headteachers, which was a key factor in schools electing to join the project. He has also led, with the support of *Catch Up* trainers, the two half-day training sessions in the six local authorities and 40 schools involved in this stage of *Catch Up Numeracy*.

2.4 The majority of schools sent both teachers (often the SENCO) and TAs to the two training days, and the management of the project in the schools has tended to reside either with the SENCO or with the maths subject coordinator. In some schools, the lead practitioners responsible for the one-to-one sessions with pupils in the intervention are the TAs while in other schools the responsibility is divided between the TAs and the SENCO/teachers.

2.5 After the second day of training the schools set about implementing the action research stage of the project. Graham Sigley sent two e-mails with updates and a card of encouragement to all participating schools.

2.6 In each local authority there is an adviser/coordinator (often the maths adviser) who liaises with the *Catch Up* headquarters team and the volunteer schools. The adviser provided a level of support which ensured that the consultative and training events were attended by all of the parties concerned and ensured that all of the central features of the project were appropriately adhered to. In addition, the adviser made arrangements for the respective meetings of teachers and TAs which were held in each local authority in July to review the progress of the intervention over the previous four months.

3 AIMS AND APPROACH OF THE EVALUATION STUDY

3.1 Three of the local authorities were selected as the focus of the evaluation study: two in England (one urban authority, Brent, and one mixed urban/rural authority, Hampshire), and one in Wales (the Vale of Glamorgan, again a mixed urban/rural authority). The evaluation will concentrate on four to five schools in each selected local authority.

3.2 The aims of the evaluation study are:

To provide an evaluative overview of the *Catch Up Numeracy* project, assessing the outcomes of the activities against the aims and objectives of the project in its three years of operation. In particular the evaluation will:

- provide a qualitative evaluation of the impact of the strategic intervention on the pupils and schools involved, addressing, *inter alia*, the impact on motivation and attitude as well as on learning
- take an overview of the quantitative data provided by the schools in their respective local authorities and compare it against the findings emerging from the qualitative information gathered
- provide an evaluation perspective to assist key players in *Catch Up Numeracy* in deciding on the development of the project in the first and subsequent years
- provide an evaluative overview across the duration of the project, a comparison between each of the years and an evaluation of the impact of the developments in the project

- make recommendations to strengthen and improve *Catch Up Numeracy.*

3.3 In the first instance the evaluator was asked to provide an overview of the research and development stage of the project and to write an interim report.

3.4 The following methods were used to collect data for the interim report, and a similar approach will also be used for the subsequent stages of the evaluation:

- one-to-one interviews with the key players involved, including the programme coordinators and other personnel in each local authority, headteachers, teachers and TAs in the participating schools (see Appendix)
- one-to-one and group interviews (16 and 2 respectively) conducted at the end of June and the first half of July in schools in the Vale of Glamorgan (10), Brent (4), and Winchester Division of Hampshire (4)
- a formal interview with the local authority coordinator in the Vale of Glamorgan (19 July) and several informal interviews
- observation of two training events in the Vale of Glamorgan
- analysis of documents relating to the project, including training materials, resource packs and school-produced materials
- attendance at the key briefing and training events and other activities such as review meetings in Brent, Winchester and the Vale of Glamorgan
- analysis of the quantitative data gathered by the *Catch Up* research team.

3.5 The interim evaluation study has focused on the impact of the intervention on the pupils, the teachers and TAs directly involved in this research and development stage. The evaluation study has also considered, in so far as data allowed, the indirect impact on headteachers and the staff as a whole (including teaching assistants and adult helpers).

4 FINDINGS OF THE EVALUATION STUDY

4.1 Training

4.1.1 The majority of the participants recognised that the sessions were both relevant and crucial in the immediate implementation of the project in their respective schools. Several of the participants suggested that without the training they could ‘not have done it’ or that they would ‘not have had the confidence’ to go about implementing the project in their schools. There was, however, a commonly held view that the training sessions for teachers and TAs were too short and were not sufficiently interactive.

4.1.2 Some participants considered that the training had not prepared them sufficiently to implement certain aspects of the project. They noted,

however, that when they had contacted *Catch Up* headquarters for further guidance, in nearly every case the help or advice which they were seeking was provided. Several interviewees expressed appreciation for the promptness and resourcefulness of the assistance or advice offered.

4.1.3 Some of the participants pointed out that training just before the Easter break was particularly unfortunate timing given the operational rhythms of their respective schools. It was, however, recognised by all concerned that on this occasion there was no way around this particular problem.

4.2 Implementation of the project

4.2.1 The teachers and TAs interviewed indicated that following the training and briefing, they had gone about expeditiously implementing the *Catch Up Numeracy* action research stage in their respective schools. Some interviewees, however, regretted that the *Catch Up* leadership had not contacted them to check how the implementation was progressing. A majority of the headteachers, teachers and TAs interviewed considered that they were reasonably well supported in this early stage of the project, but there was a strongly held view that practitioner meetings to share successes and problems would have been particularly helpful.

4.2.2 Those interviewed commented that the time constraints imposed by 15-minute one-to-one sessions are quite challenging and that it would be helpful to have further guidance (particularly on assessment), resources, DVDs and videos to support the work. The following quotes reflect this view:

- 'We need more guidance on selection.'
- 'We need more resources – perhaps a pack.'
- 'Some of the form filling was difficult – some of the wording was not specific enough.'
- 'It was sometimes difficult to link the intervention to what was going on in the classroom.'
- 'It would have been helpful if the guidance had been more structured.'
- 'We need better suggestions of a structured 15–20 minute one-to-one session. We need more resources and some model tutorial sessions.'
- 'The *Catch Up Numeracy* documentation is too brief. It's too mechanistic. There is no second string strategy when the first offering fails.'

4.3 Assessment

4.3.1 Several of the teachers/TAs spoke positively about the value of the assessment process and instruments. Furthermore, several teachers/TAs indicated that the benefit of *Catch Up Numeracy*, and particularly the assessment element, was that it helped them see the gaps in pupils' mathematical learning and what support and activity needs to be undertaken to help pupils improve. Moreover, they emphasised that when the components were 'broken down' it sharpened their thinking and gave them new insights into numerical accomplishment.

- ‘It helped me interpret what I was supposed to be assessing and [also] to interpret the “teacher’s notes” into an effective one-to-one tutorial experience.’
- ‘The assessments did show us where the pupils were struggling and what we might do with them and for them.’

4.3.2 Some of those interviewed expressed reservations about aspects of the assessment:

- ‘Some of the [assessment] activities were too easy. We had to follow the directions laid down, i.e. only go to levels 1–3 and then move onto levels 4–6 next time. Some of this was too drawn out for our pupils.’
- ‘We had to learn very fast. We did the assessment in a week when it should have been over two to three weeks.’
- ‘You have, in the estimation component, “silly” or “good” with nothing in between. We need to explain to pupils why we need to do estimation.’
- ‘I did the initial assessment. [In future] I would do some of them more rapidly. We need more games. We need to do more fun things.’

4.4 Impact of the project

4.4.1 In nearly every case teachers/TAs and headteachers were very positive about *Catch Up Numeracy* and felt that the intervention was a powerful adjunct to pupil learning in numeracy. It was suggested by several teachers that the intervention helped them become more focused in their planning and that they were able to break down, in an efficient manner, the difficulties their pupils were experiencing in learning arithmetic.

> ‘We can now go directly to the area/component of the difficulty and then tackle it at the appropriate level.’

In addition, several interviewees emphasised that the breaking down of maths had made the pupils more skilful and that this feature could be given more weight by providing more thinking time:

> ‘One-to-one makes a big difference to the quality of learning. Their [the pupils’] thinking ability has been improved. The ‘breaking down’ of maths has made them more skilful but they need more thinking time.’

4.4.2 This belief was reinforced by teachers and TAs who pointed out that *Catch Up Numeracy* had a structure that was essentially diagnostic. It was based on analysis and assessment and finding out where ‘pupils were at’ and not on assumptions. It was suggested that *Catch Up Numeracy* brought new tools and a new methodology to tackling underachievement in numeracy. One teacher maintained that ‘the assessment insights from *Catch Up Numeracy* have given me a maths map that I never had before’.

4.4.3 Furthermore, a large majority of teachers/TAs interviewed were of the opinion that pupils involved in the intervention had gained in confidence,

had changed their attitude about maths and were willing to 'have a go', whereas before they would not have tried. In some cases the pupils were beginning to enjoy doing maths, and this signalled a change of attitude during the course of the intervention.

4.4.4 *Catch Up Numeracy* had given pupils a belief that maths was doable, and several teachers/TAs thought that pupils, as a result of the intervention, engaged better in classroom activities and the learning which stemmed from it. Moreover, some interviewees cited the sense of achievement of pupils who previously had been at 'rock bottom' and their willingness to express what this improvement had meant to them.

4.4.5 Several teachers/TAs stated that pupils derive considerable benefit from one-to-one sessions and that they are able to say what they are not good at and discuss where they need help. It was also stressed that the intervention helped the pupils involved to have a direct sense of the progress that they were making as they moved up through the levels.

4.4.6 Both the BAS and the Standardised Tests were used in March as baseline tests; these were repeated in July. The Standardised Tests provisionally revealed that, on average, the cohort of 62 pupils involved in the intervention gained 7.4 months in their number ages, while the control group of 12 pupils gained 2.9 months.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.1.1 In considering the quantitative and qualitative data, it is clear that the action research stage of the project has improved the numeracy of the pupils directly involved in the intervention and has also made mathematics more interesting, more enjoyable and more doable. The experience of the pupils in the intervention strongly suggests that the approach of *Catch Up,* particularly the one-to-one sessions, has changed their attitude to mathematics and has led to their being better engaged in classroom activities in numeracy and related issues.

5.1.2 The teachers and TAs involved in the project have also gained professionally, and believe that they have a better appreciation and understanding of how pupils learn mathematics and what tutorial work needs to be undertaken in order to improve the numerical attainment of the pupils.

5.1.3 In the schools the project management is normally the responsibility of the SENCO or the maths subject coordinator. They believe that they themselves have benefited from their involvement in the project, but, even more importantly, the training and involvement in the project has given a new dimension to the TAs' professional role and their contribution to pupil numeracy.

5.1.4 It was widely recognised by headteachers, SENCOs and maths subject coordinators that without the training and supporting documentation it would not have been possible to establish the project in their schools. Although the training was evidently too short and not sufficiently interactive, it nevertheless gave the teachers and the TAs sufficient conceptual and practical insights to enable them to implement the project in an effective and resourceful manner.

5.1.5 It was widely recognised that the project had made a good beginning but that there was a need for more guidance, including examples of model sessions (with timed elements indicating the content and structure of such sessions) and additional resources, possibly in the form of a pack which would also involve second-stage activities when the first offering had not worked.

5.2 Recommendations

5.2.1 In order to build on the initial successes of the project to date, it is recommended that:

- a new standardised test instrument should be developed which more comprehensively covers the age range at which the intervention is targeted
- initial training should follow the classical *Catch Up* approach of three half-day sessions, with follow-up activity in schools
- coordinator training should be provided
- a guidance manual should be produced covering the central aspects of the *Catch Up Numeracy* project
- arrangements should be made in all participating authorities for practitioners to meet at regular intervals to share good practice and to exchange ideas and resources.

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August 2007

APPENDIX

Schools visited for the evaluation study, June–July 2007

Brent

St Mary's Church of England Primary School

Oliver Goldsmith Primary School

Lyon Park Infants School

North View Crescent Infants and Junior School

Winchester (Hampshire)

Stanmore Primary School

Saint John the Baptist Church of England Primary School, Waltham Chase

Forest Edge Primary School, Totten

Calmore Primary School

Vale of Glamorgan

Colwinston Church of Wales Primary School

Jenner Park Primary School, Barry

Saint Nicholas Church of Wales Primary School

Victoria Primary School, Penarth

LLantwit Fawr Primary School